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edited by Barton C. Hacker

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Introduction

Introducing the journal's first multiyear index fifteen years ago, I noted that "the 5,902 pages in the first ten volumes of *Technology and Culture* played a major part in making the history of technology a recognized field of scholarly inquiry." Other journals having followed *T & C's* lead, the field has flourished, but *T & C's* value seems in no way diminished after twenty-five years. As the number of published pages grew to approach 18,000, however, the problem of access expanded commensurately. Annual indexes help, of course, but they suffer inherent limitations; no one ever doubted the need for a cumulative twenty-five-year index to cover the 100 issues between fall 1959 and October 1984. Unfortunately, early plans for timely publication fell afoul of culture and technology, to say nothing of institutional inertia and human vagary.

Eventually, all obstacles were surmounted. Thus the present volume. Like the ten-year index, it has two parts: first, a listing of authors and titles, second, of subjects. Potential users may benefit from a few notes on structure and arrangement.

Part One: Author-Title Index

The author-title index covers everything published in *T & C* except advertisements. It also includes authors and titles of all books reviewed. Citations are to *T & C* volume number and first page. Author entries begin with full names of all authors (as shown in the journal); elsewhere names are shortened to initials and last names in title entries, or last names only in entries for reviews. Second authors are listed, but cross-referenced to the main entry, that of the first author. After authors' names, titles are listed in order of *T & C* publication within four categories: (1) articles and other titled contributions, individually annotated; (2) book reviews, including those of the author's own books, indicated by (R) after the title, as well as books the

author has reviewed, indicated by (R) before the title; (3) edited works; and (4) joint works. Title entries begin with full titles and subtitles (again, as shown in the journal), followed by author's initials and last name. Elsewhere subtitles of books are omitted.

Part Two: Subject Index

The subject index includes entries of several kinds. There are three major categories of larger subjects: time-oriented (e.g., Ancient Technology, Prehistory, World War I), place-oriented (e.g., Africa, East Asia, Midwestern United States, Paris), and field-oriented (e.g., Aeronautical Engineering and Technology, Labor History, Values and Technology). Subcategories vary somewhat according to the specific topic, but generally involve temporal and geographic cuts. My approach throughout has been basically empirical, guided by my desire to accommodate the specific contents of *T & C*'s first twenty-five volumes. I have sought to avoid imposing any a priori notions of how the subject matter of the history of technology ought to be sorted. Extensive cross-references should help you find your way.

Individual persons, companies, institutions, artifacts, and the like each have separate entries, if named in a title or seemingly a major subject. I have not tried to locate every mention, however casual; instead I focused on identifying reasonably substantive discussion. Citations are to the volume number and first page of the article or review in which the subject appears, not to specific pages. Books, perhaps needless to say, are sorted only on the basis of the review as published in *T & C*; to a significant degree, what is classified in the *T & C* subject index is the review rather than the work reviewed. Quite apart from questions of subjectivity, some works have been harder than others to classify. For the inevitable errors, my apologies. For your patience, my thanks.

BARTON C. HACKER

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and maintained the traditional cavalry tactics of the steppes.

———, "Early Medieval Fortifications in the 'West' of France: A Revised Technical Vocabulary," 16:531
Analysis of Ademar of Chabannes *Chronicon* yields a sound basis for distinguishing types of fortified places.

———, "Fortifications and Military Tactics: Fulk Nerra's Strongholds circa 1000," 20:531
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———, *Merovingian Military Organization* (R) 14:497; (R) Tsangadas, *The Fortifications and Defense of Constantinople*, 23:477; (R) Duby, *The Three Orders*, 23:647

"The Back-to-Nature Movement: Alternative Technologies and the Inversion of Reality," T. R. De Gregori, 23:214

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On Besson's *Theatrum instrumentorum et machinarum*, a compendium of mechanical inventions believed to have appeared first in 1571–72, then widely reprinted and translated; cf. Davis, 7:513

———, "A New Look at the 'Whitney' Milling Machine," 14:592

The so-called Whitney milling machine was probably based on John Hall's "straight cutting machine" of 1827.

———, "Technological Innovation and the Decorative Arts: Hagley Museum, March 29, 1973–January 1, 1974," 15:242

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———, "The Role of Automata in the History of Technology," 5:24
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———, "The Evolution of Science Museums," 6:1
On museums of the physical sciences and technology, with a table listing names, dates, locations, nature of collections, and uses of science museums through the nineteenth century.

———, "A Renaissance Lapidary Lathe," 6:407
The earliest artifact of lapidary art now known, probably constructed in the later sixteenth century for Archduke Francesco I de'Medici.

———, "An Early Optical Lens-grinding Lathe," 8:74
The earliest known illustration of an apparatus designed specifically to make lenses was a woodcut first published in a treatise on optics by Count Carlo Antonio Manzini (ca. 1605–77).

———, "The Aerial Telescope," 8:395
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———, "The Perspective Machine of Wentzel Jamnitzer," 9:197
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———, "The Unfinished Utrecht Quadrant," 10:432
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———, "Maria Luisa Righini Bonelli (1917–1981)," 23:531
Memorial to the long-time director of the Istituto e Museo di Storia della Scienza and professor at the University of Florence.

———, "Derek J. de Solla Price (1922–1983)," 25:701
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———, (R) Eckhardt, *United States Clock and Watch Patents,* 2:278; (R) Hoopes, *Shop Records of Daniel Burnap,* 2:280; (R) Smart, *The Makers of Surveying Instruments in America since 1700,* 5:260; *The Scent of Time,* (R) 5:446; (R) Lee, *The Knibb Family,* 5:608; (R) Brewington, *The Peabody Museum of Collection of Navigating Instruments,* 5:640; (R) Bassermann-Jordan, *The Book of Old Clocks and Watches,* 6:451; (R) Lloyd, *The Collector's Dictionary of Clocks,* 6:451; *Early American Scientific Instruments and Their Makers,* (R) 6:464; (R) Clatton and Daniels, *Watches,* 8:94; (R) Bradbury and Turner, eds., *Historical Aspects of Microscopy,* 9:603; (R) Bobinger, *Kunstuhrmacher in Alt-Augsburg,* 12:490; (R) Jeiter and Helfrich-Dörner, *Die Uhr, Zeitmesser und Schmuck in fünf Jahrhunderten,* 12:490; (R) Cunynghame, *Time and Clocks,* 12:490; (R) Mody, *Japanese Clocks,* 12:490; (R) Wright, *Clockwork Man,* 12:490; *The Life of Benjamin Banneker,* (R) 14:84; (R) Gardet et al., *Cultures and Time,* 21:87; (R) North, *Richard of Wallingford,* 21:87; (R) Maurice, *Die deutsche Räderuhr,* 21:87; (R) Bonelli, ed., *Annali dell'Istituto e museo di storia della scienza di Firenze,* 21:92; (R) Grant and Wilson, eds., *The Book of Time,* 24:117; (R) McConnell, *Geomagnetic Instruments before 1900,* 24:267; (R) Hughes, *Surveyors and Statesmen,* 24:267

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———, "Science and the Federal Government, 1970: In Retrospect," 12:243
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———, "The Improvement of Instruments and the Growth of Scientific Ideas," 12:247
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teenth century astronomy, Trevor Levere on instruments in the chemical revolution, Otto Mayr on nineteenth-century physicists and speed regulation, and comments by Stanley Jaki.

———, [Works-in-progress II,] 21:466
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Benson, Barbara E., "The Engineer as an Agent in Technology Transfer. Eleutherian Mills Historical Library Spring Conference on Regional Economic History, Greenville, Wilmington, Delaware, May 1974," 16:67
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Benson, John, *British Coalminers in the Nineteenth Century,* (R) 23:260
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Bird, R. H., *Yesterday's Golcondas*, (R) 20:800

Bird, William L., Jr., "A Suggestion Concerning James Smithson's Concept of 'Increase and Diffusion,'" 24:246

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———, "Medieval Waterpower," 24:479

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Bose, Christine E., Philip L. Bereano, and Mary Malloy, "Household Technology and the Social Construction of Housework," 25:53
Empirical study challenges the popular belief that changing technology has made housework easier, cheaper,

quicker, or less gender-specific.

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Boulding, Kenneth E., "The Role of the Museum in the Propagation of Developed Images," 7:64

Properly conceived museums might not only promote communication between the two intellectual subcultures but also transmit more advanced world views from intellectual to folk subcultures.

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Bowley, Marian, *The British Building Industry*, (R) 8:113

Bowman, Mary Jean, and W. Warren Haynes, *Resources and People in East Kentucky*, (R) 6:142

Boyd, Andrew, *Chinese Architecture and Town Planning*, (R) 5:92

Boyd, T. A., "The Charles F. Kettering Archives," 5:412

On Kettering (1876–1958), founder of the General Motors Research Laboratories, rather than the archives, merely announced.

———, "The Self-Starter," 9:585

Kettering's Dayton Engineering Laboratories Company entirely developed the electric self-starter for cars; cf. Edwards, 9:592.

"Boyd on Kettering and Leland," C. E. Edwards, 9:592

Boyer, Carl B., and Marjorie Nice Boyer, "Lynn Thorndike (1882–1965)," 7:391

Memorial to the noted medievalist and student of the relations between magic and experimental science.

Boyer, Marjorie Nice, "Medieval Pivoted Axles," 1:128

The thesis that knowledge of the pivoted axle vanished in the Middle Ages rests on suspect pictorial evidence and tends to be refuted by the common use of four-wheel vehicles for long-distance hauling, virtually impossible without a turning train.

———, "Rebuilding the Bridge at Albi, 1408–1410," 7:24

Unusually complete financial records from the archives of Albi (in southern France) illuminate such otherwise little-known aspects of medieval bridge-building as methods, materials, and labor.

———, *Medieval French Bridges*, (R) 19:212; *see also* Boyer, Carl B.

Boyer, Ronald K., (R) Mullen, *Personality and Productivity in Management*, 8:255

"The Boyers' Locomotive Toy," R. A. Spong, 13:373

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Bragdon, Charles R., *Metal Decorating from Start to Finishes*, (R) 4:219

Brain of the Firm: The Managerial Cybernetics of Organization, S. Beer, (R) 15:129

Brainerd, John G., "Some Unanswered Questions," 11:601
Communication concerning Brittain, 11:36.

———, "The Open University and the History of Technology," 17:235
Critique of an Open University faculty text, *Science and the Rise of Technology since 1800*.

———, "Genesis of the ENIAC," 17:482
Reminiscences of the first large-scale, general-purpose, electronic digital computer by the project's supervisor.

———, "International Research Conference on the History of Computing, Los Alamos, June 10–15, 1976," 18:218
The conference addressed both U.S. and European developments from the 1940s onward, with attention to programming as well as machines.

———, "Nuclear Power: Two Sides," 18:503
Communication questioning the implied bias in a review by Del Sesto, 17:401; cf. Del Sesto's reply, 18:505.

———, [Electronic computer history,] 22:572
Summary of a session at SHOT's 1980 Toronto meeting with papers by Nancy Stern on Eckert and Mauchly, Thomas Smith on Project Whirlwind, Roger Stuewer on Babbage Center plans, and comments by I. B. Cohen.

———, (R) Heilbroner, *An Inquiry into the Human Prospect*, 17:187; (R) Fagen, ed., *A History of Engineering and Science in the Bell System*, vol. 1, 18:113; (R) Brooks, *Telephone*, 18:706; (R) U.S. Energy Research and Development Administration, *A National Plan for Energy Research*, 18:720; (R) Kash et al., *Our Energy Future*, 18:720; (R) Shabad and Mote, *Gateway to Siberian Resources*, 20:250; (R) *Scientific American* Editors, *Microelectronics*, 20:390; (R) Merzbach, *Scheutz and the First Printing Calculator*, 20:390; (R) Fagen, ed., *A History of Engineering and Science in the Bell System*, vol. 2, 20:817; (R) Stobaugh and Yergin, eds., *Energy Future*, 22:217; (R) Phillips, *The Last Chance Energy Book*, 22:217; (R) Joint Economic Committee Staff, *Chinese Economy*, 22:686; (R) Metropolis et al., eds., *A History of Computing in the Twentieth Century*, 24:147

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Braun, Ernest, and Stuart Macdonald, *Revolution in Miniature*, (R) 25:882

Braun, Hans-Joachim, "Dissertations and Works-in-Progress in the History of Technology," 23:463
Summaries of a session at SHOT's 1981 Milwaukee meeting with papers by John Harris on the eighteenth-century transfer of hardware technology between England and France, Christopher Hamlin on sewage recycling in nineteenth-century Britain, Sheldon Hocheiser on technological innovation and political controversy in the Florida citrus industry, and Richard Hirsh on the use of historical research for planning electrical utility rate structures.

———, *Technologische Beziehungen zwischen Deutschland und England*, (R) 17:554; (R) Scholl, *Ingenieure in der Frühindustrialisierung*, 21:250; (R) Rapp, *Analytische Technikphilosophie*, 23:88; (R) Wendorff, *Zeit und Kultur*, 23:229; (R)

Slotta, *Technische Denkmäler in der Bundesrepublik Deutschland,* 23:659; (R) Rürup, ed., *Wissenschaft und Gesellschaft,* 24:717

Braun, Wernher von, "The Redstone, Jupiter, and Juno," 4:452

Army development of the first large U.S. ballistic missile and its several modifications as space booster.

———, *Space Frontier,* (R) 9:251

Braun, Wernher von, and Frederick I. Ordway III, *History of Rocketry and Space Travel,* (R) 9:250; *The Rockets' Red Glare,* (R) 19:247

Bray, Francesca, "Swords into Plowshares: A Study of Agricultural Technology and Society in Early China," 19:1

On the sources for the origin and development of the plow in Shang and Chou China.

———, (R) Asian Development Bank, *Rural Asia,* 20:386; (R) International Rice Research Institute, *Economic Consequences of the New Rice Technology,* 21:547; (R) Hayami et al., *Anatomy of a Peasant Economy,* 21:547

Braynard, Frank O., (R) Dunbaugh, *The Era of the Joy Line,* 25:880

Brazil: The Land and the People, R. E. Poppino, (R) 15:510

Brecher, Jeremy, Jerry Lombardi, and Jan Stackhouse, eds., *Brass Valley,* (R) 25:348

Brecher, K., and M. Feirtag, eds., *Astronomy of the Ancients,* (R) 22:300

Bredo, William, *Industrial Estates,* (R) 2:295

Breimeyer, Harold F., *Individual Freedom and the Economic Organization of Agriculture,* (R) 7:568

Brenner, Michael J., *Nuclear Power and Non-proliferation,* (R) 24:303

Brentjes, Burchard, Siegfried Richter, and Rolf Sonnemann, eds., *Geschichte der Technik,* (R) 22:607

Brewer, John; *see* McKendrick, Neil

The Brewing Industry in England, 1700–1830, P. Mathias, (R) 1:188

Brewington, Marion V., *The Peabody Museum Collection of Navigating Instruments,* (R) 5:640

Brezzi, Paolo; *see* Pareti, Luigi

Brichford, Maynard J., *Scientific and Technological Documentation,* (R) 11:487

Brickman, Ronald, (R) Killian, *Sputnik, Scientists, and Eisenhower,* 19:779; (R) Kistiakowsky, *A Scientist at the White House,* 19:779; (R) Weart, *Scientists in Power,* 21:268

"Bridge to the Future: A Symposium Commemorating the Centennial of the Brooklyn Bridge—New York City, May 18–20, 1983," B. Hindle, 25:294

"Bridge-building Technology," N. Fitz-Simons, 25:626

Bridges: The Spans of North America, D. Plowden, (R) 16:310

Bridges, Docks and Harbours with Related Works, J. Elton, ed., (R) 24:710

Bridges of Metropolitan Cleveland: Past and Present, S. R. Watson and J. R. Wolfs, (R) 24:539

"A Brief Note on Rubber Technology and Contraception: The Diaphragm and the Condom," V. L. Bullough, 22:104

Brier, Alan, and Ian Robinson, *Computers and the Social Sciences,* (R) 17:580

Briggs, Asa, *The Birth of Broadcasting,* (R) 4:103; *The Golden Age of Wireless,* (R) 7:102; (R) Gutnov et al., *The Ideal Communist City,* 12:676; (R) Lewis, ed., *The City in Communist China,* 14:95; (R) Brooke, *London,* 17:123; (R) Coppa and Dolce, eds., *Cities in Transition,* 17:548; *Iron Bridge to Crystal Palace,* (R) 22:306; *The Power of Steam,* (R) 24:514

Briggs, J. Morton, Jr., (R) Hahn, *The Anatomy of a Scientific Institution,* 13:312

Bright, Charles DeLotter, (R) Knaack, *Encyclopedia of U.S. Air Force Aircraft and Missile Systems,* 20:826; (R) Gunston, *By Jupiter!* 21:134; *The Jet Makers,* (R) 21:135; (R) Lewis and Newton, *Delta,* 21:528; (R) Hurley and Ehrhart, eds., *Air Power and Warfare,* 22:198

Bright, James R., ed., *Technological Forecasting for Industry and Government,* (R) 12:376

The Bright and Glowing Place, F. Rowsome, Jr., (R) 17:575

Brightfield, Myron F., "The Coming of the Railroad to Early Victorian England, as Viewed by Novels of the Period (1840–1870)," 3:45

Excerpts from contemporary novels suggest how the new form of transport affected English life.

Brill, Robert H., ed., *Science and Archaeology,* (R) 14:77

Bringing Aerodynamics to America, P. A. Hanle, (R) 24:142

Brinton, Crane, (R) Kahler, *The Meanings of History,* 6:535; (R) Toynbee, *Change and Habit,* 9:102

Britain's Imperial Air Routes, 1918 to 1939: The Story of Britain's Overseas Airlines, R. Higham, (R) 6:317

The Britannia Bridge: The Generation and Diffusion of Technological Knowledge, N.

Rosenberg and W. G. Vincenti, (R) 21:100

The British Building Industry: Four Studies in Response and Resistance to Change, M. Bowley, (R) 8:113

British Coalminers in the Nineteenth Century: A Social History, J. Benson, (R) 23:260

The British Coalmining Industry: Retrospect and Prospect, A. R. Griffin, (R) 19:228

British Economic Growth, 1688–1959, P. Deane and W. A. Cole, (R) 4:350

British Economic History, 1870–1914: Commentary and Documents, W. H. B. Court, (R) 7:530

The British Economy, R. Harrod, (R) 5:462

The British Electrical Industry, 1875–1914: The Economic Returns of a New Technology, I. C. R. Byatt, (R) 21:664

"British Electrical Industry Lag: 1882-1888," T. P. Hughes, 3:27

"The British Electron-Tube and Semiconductor Industry, 1935–1962," J. Kraus, 9:544

British Farming in the Great Depression, 1870–1914: An Historical Geography, P. J. Perry, (R) 15:645

British Industry between the Wars: Instability and Industrial Development, 1919–1939, N. K. Buxton and D. H. Aldcroft, (R) 22:370

The British Internal-Combustion Locomotive, 1894–1940, B. Webb, (R) 16:301

British Investment in American Railways, 1834–1898, D. R. Adler, (R) 13:78

The British Motor Industry, 1896–1939, K. Richardson, (R) 20:233

British Paddle Steamers, G. Body, (R) 16:301

British Plane Makers from 1700, W. L. Goodman, (R) 10:447

"British Response to the American System: The Case of the Small-Arms Industry after 1850," R. I. Fries, 16:377

The British Rigid Airship, 1908–1931: A Study in Weapons Policy, R. Higham, (R) 6:312

British Shipping, R. H. Thornton, (R) 2:73

The British Soldier's Firearm, 1850–1864, C. H. Roads, (R) 8:223

British Weights and Measures: A History from Antiquity to the Seventeenth Century, R. E. Zupko, (R) 20:210

Britkin, A. S., *The Craftsmen of Tula*, (R) 10:608

Britkin, A. S., and S. S. Vidonov, *A. K. Nartov*, (R) 7:426

Brittain, James E., "The Introduction of the Loading Coil: George A. Campbell and Michael I. Pupin," 11:36

A major innovation in long-distance telephony commonly attributed to heroic inventor Pupin, the loading coil depended on sophisticated mathematical physics and may actually have been the first significant product of industrial research; awarded the 1971 Abbott Payson Usher Prize; cf. Brainerd, 11:601; Espenschied, 11:596; Jackson, 11:598.

———, "Applications of Electrical Science," 14:440

Notes on a session at SHOT's 1972 Washington meeting with papers by Robert Post on Charles Page, Romualdo Sviedrys on Cavendish Laboratory electrical standards, John Miller on Rowland's electromagnetic models, and comments by Thomas Hughes.

———, "Modern Communications: Aspects of the Growth of Electronics and Radio," 16:429

Summary of a session at SHOT's 1974 Chicago meeting with papers by Thomas Smith on invention and institutionalization in twentieth-century electronics, Arthur Norberg on the Federal Telegraph Company, Charles Süsskind on electronics in the 1930s, and comments by Thomas Hughes.

———, [Works-in-progress,] 18:487

Summaries of a session at SHOT's 1976 Philadelphia meeting with papers by Richard Schallenberger on the storage battery, Randall Catoe on gold extraction, John Staudenmaier on patterns and themes in *T&C*, Robert Friedel on bakelite, Melvin Usselman on Wollaston's platinum process, Eleanor Maass on Greville Bathe's library, and David Channell on Rankine's thermodynamics.

———, "Edison in Combat: Inventors in Competition," 21:448

Summary of a session of the Edison Bicentennial Symposium at SHOT's 1979 Newark meeting with one paper by Robert Bruce on Bell and Edison, a second by Theodore Bernstein and Terry Reynolds on the AC-DC controversy and legal electrocution.

———, "Corporate Research in the 20th-Century American Electrical Industry," 25:631

Summary of a session at SHOT's 1983 Washington meeting with papers by Leonard Reich on GE and Bell Labs, Margaret Graham on RCA, Neil Wasserman on automatic switching at AT&T, and comments by David Mowry.

———, (R) Pole, ed., *The Life of Sir William Fairbairn*, 12:504; (R) Reingold et al., eds., *The Papers of Joseph Henry*, vol. 1, 15:103; (R) ibid., vol. 2, 18:101; (R) ibid., vol. 3, 22:327; (R) American Society of Civil Engineers, ed., *American Wooden Bridges*, 18:100; (R) Whitrow, ed., *ISIS Cumulative Bibliography*, 19:266; (R) Reingold, ed., *The Sciences in the American Context*, 22:325

———, ed., *Turning Points in American Electrical History*, (R) 19:564

Brittain, James E., and Robert C. McMath, Jr., "Engineers and the New South Creed: The Formation and Early Development of Georgia Tech," 18:175
Engineering shop culture was compatible with late nineteenth-century Southern ideology, but the link failed by century's end.

Brittain, Robert, (R) Rasmussen, ed., *Readings in the History of American Agriculture*, 2:183; (R) Andrews, *The Farmer's Dilemma*, 3:353; (R) Sears, *Where There Is Life*, 4:113

Brock, P. W., and Basil Greenhill, *Steam and Sail in Britain and North America*, (R) 15:644

Brockway, Lucile H., *Science and Colonial Expansion*, (R) 22:809

Brody, David, *Steelworkers in America*, (R) 2:409

Broehl, Wayne G., Jr., *Precision Valley*, (R) 2:180

Bromberg, Joan Lisa, (R) Del Sesto, *Science, Politics, and Controversy*, 24:527; *Fusion*, (R) 25:154

Bronowski, Jacob, *The Visionary Eye*, (R) 21:139

Bronson, Bennet; see Rostoker, William

The Bronze Age Cultures in Central and Eastern Europe, M. Gimbutas, (R) 13:299

Bronze Casting and Bronze Alloys in Ancient China, N. Barnard, (R) 3:178

Brooke, Christopher, with Gillian Keir, *London*, (R) 17:123

Brooke, George M., Jr., *John M. Brooke*, (R) 23:673

Brooklyn Bridge: Fact and Symbol, A. Trachtenberg, (R) 7:109

Brooks, Courtney G., James M. Grimwood, and Loyd S. Swenson, Jr., *Chariots for Apollo*, (R) 21:531

Brooks, H. Allen, *The Prairie School*, (R) 13:651

Brooks, John, *Telephone*, (R) 18:706

Brophy, Leo P., George J. B. Fisher, Wyndham D. Miles, and Rexmond C. Cochrane, *The Chemical Warfare Service*, (R) 2:417

Brough Superior—the Rolls Royce of Motor Cycles, R. H. Clark, (R) 7:94

Brown, A. E., and H. A. Jeffcott, Jr., *Absolutely Mad Inventions*, (R) 13:525

Brown, Alan; *see* Stone, Richard

Brown, Alexander Crosby, *Juniper Waterway*, (R) 25:658

Brown, Allen; *see* Teller, Edward

Brown, D. Clayton, (R) Cotton, *A History of the Waterways Experiment Station*, 21:519; *Rivers, Rockets and Readiness*, (R) 22:187; *Electricity for Rural America*, (R) 22:315

Brown, Giles T., *Ships That Sail No More*, (R) 10:321

Brown, Henry T., *Five Hundred and Seven Mechanical Movements*, (R) 24:719

Brown, John J., "Museum Census: A Survey of Technology in Canadian Museums," 6:83
Listing of 120 Canadian museums that might interest historians of technology.

Brown, Joyce, *Mathematical Instrument-Makers in the Grocers' Company*, (R) 21:494

Brown, Lawrence A., *Innovation Diffusion*, (R) 25:316

Brown, Lester R., *Seeds of Change*, (R) 12:146

Brown, M. L., *Firearms in Colonial America*, (R) 23:118

Brown, R. Allen, H. M. Colvin, and A. J. Taylor, *The History of the King's Works*, (R) 6:269

Brown, R. K.; *see* Parker, S. R.

Brown, Robert McAfee, (R) Mohan, ed., *Technology and Christian Culture*, 3:371; (R) Wiener, *God & Golem, Inc.*, 6:531

Brown, Sanford C., ed., *The Collected Works of Count Rumford*, (R) 12:640

Brown, Shannon R., "The Ewo Filature: A Study in the Transfer of Technology to China," 20:550
Efforts to establish a modern silk filature in the 1860s foundered on traditional Chinese institutions and values.

———, (R) Rosegger, *The Economics of Production and Innovation*, 25:149

Brown, Theodore M., *Margaret Bourke-White*, (R) 14:669

Brown, William; *see* Kahn, Herman

Bruce, Robert V., (R) Cudahy, *Change at Park Street Under*, 14:642; *Bell*, (R) 15:334

Bruchey, Stuart, *The Roots of American Economic Growth*, (R) 7:103

———, ed., *Small Business in American Life*, (R) 22:800

Brugmans, H., (R) Woodruff, *Impact of Western Man*, 9:98

Brumbaugh, Robert S., *Ancient Greek Gadgets and Machines*, (R) 9:218

Brunelleschi: Studies of His Technology and Inventions, F. D. Prager and G. Scaglia, (R) 12:498

Brunel's Britain, D. Beckett, (R) 23:508

Brunner, Elizabeth, (R) Heal, *Industrial Britain*, 17:165

Bruno, Leonard C., *We Have a Sporting Chance*, (R) 21:531

"The Brush Double-Arc Lamp," H. J. Eisenman, 7:511

Bruton, Eric, *The History of Clocks and Watches*, (R) 22:302

Bryant, John, "Systems Theory, Survival, and the Back-to-Nature Movement," 21:227

Communication discussing Halley and Vatter (19:53), suggesting that technology may lag culture as well as vice versa; cf. De Gregori, 23:214.

———, "The Back-to-Nature Movement, Modern Technology, and the Inversion of Dr. De Gregori," 23:218

Communication responding to De Gregori, 23:214.

Bryant, Keith L., Jr., *Arthur E. Stilwell*, (R) 14:88; (R) Miner, *The St. Louis-San Francisco Transcontinental Railroad*, 14:639

Bryant, Lynwood, "The Silent Otto," 7:184

In a sudden denouement to 75 years of fumbling development, Nicolaus August Otto (1832–91) built the first successful engine operating on the four-stroke cycle in 1876.

———, "The Origins of the Four-Stroke Cycle," 8:178

Despite other claims advanced in patent litigation at the time and by later writers, the credit belongs to Otto.

———, "The End of the Marcus Legend," 12:618

Siegfried Marcus' alleged 1875 car was actually built in 1888.

———, "The Role of Thermodynamics in the Evolution of Heat Engines," 14:152

Theoretical and practical considerations interacted in the evolution from steam engine to internal combustion engine.

———, "The Development of the Diesel Engine," 17:432

Invention, development, and innovation proceeded simultaneously in the conversion of idea to working hardware, then to real-world machine; awarded the 1979 Abbott Payson Usher Prize.

———, "Numerical Control of Machine Tools: How a New Technology Is Conceived, Developed, and Exploited," 19:472

Notes on a session at SHOT's 1977 Washington meeting with papers by John Ward on development at MIT; Francis Reintjes on academic, military, and industrial interactions; Eugene Merchant on numerical control's industrial impact; and comments by Otto Mayr.

———, (R) Sass, *Geschichte des deutschen Verbrennungsmotorenbaues von 1860 bis 1918*, 5:82; (R) Nitske and Wilson, *Rudolf Diesel*, 7:90; (R) Goldbeck, *Kraft für die Welt*, 7:429; (R) Goldbeck, *Gebändigte Kraft*, 8:105; (R) Ickx, *Ainsi naquit l'automobile*, 9:237; (R) Goldbeck, *Christian Reithmann*, 9:489; (R) Mauel, *Die Rivalität zwischen Heissluftmaschine und Verbrennungsmotor als Kleingewerbemaschinen zwischen 1860 und 1890*, 10:104; (R) Sonnenberg, *Hundert Jahre Sicherheit*, 11:451; (R) Seper, *Damals als die Pferde scheuten*, 12:659; (R) Flink, *America Adopts the Automobile*, 12:661; (R) Janota, ed., *Vehicle Engines*, 17:175; (R) Day, *The Bosch Book of the Motor Car*, 18:110; (R) Cummins, *Internal Fire*, 18:703

Bryant, Lynwood, and A. R. Rogowski, (R) Kolin, *Thermodynamics Atlas*, 15:641; (R) Hall and Smith, eds., *History of Technology*, 18:738

Bryant, Paul T., (R) MacKaye, *The New Exploration*, 5:469

Bryce, Herrington J., ed., *Small Cities in Transition*, (R) 20:665

Bryden, D. J., *Scottish Scientific Instrument-Makers*, (R) 18:694; (R) Cossons and Trinder, *The Iron Bridge*, 22:306; (R) Smith, *A View from the Iron Bridge*, 22:306; (R) Briggs, *Iron Bridge to Crystal Palace*, 22:306; *see also* Stock, John T.

Buch und Wissenschaft: Beispiele aus der Geschichte der Medizin, Naturwissenschaft und Technik, E. Schmauderer, ed., (R) 12:395

Buchanan, H. Ray, (R) Gerschenkron, *Europe in the Russian Mirror*, 12:351

Buchanan, R. A., "The Centre for the Study of the History of Technology, Bath University of Technology, England," 9:430

Since its founding in 1964, the group has built a program of work

and research chiefly in industrial archaeology.

———, "Lionel Thomas Caswall Rolt (1910–1974)," 16:454
Memorial to the great popularizer of the history of technology.

———, "Second International Congress on the Conservation of Historical Monuments: Bergbau-Museum, Bochum, Germany, September 3–9, 1975," 17:245
The congress addressed the theory and social aspects of industrial archaeology and the documentation and preservation of industrial monuments.

———, "The *Great Eastern* Controversy: A Comment," 24:98
Communication concerning Emmerson (21:553), acknowledging Rolt's inadequate depiction of Russell, but insisting that questions about the ship's unfortunate career remain unanswered; cf. Emmerson, 24:107.

———, "ICOHTEC Symposium: Smolenice, Czechoslovakia, June 7–12, 1982," 24:495
The International Committee for the History of Technology symposium had as its theme "Sources for the History of Technology—National Comparisons."

———, (R) Pannell, *Techniques of Industrial Archaeology,* 9:109; (R) Kranzberg and Pursell, eds., *Technology in Western Civilization,* 9:468; (R) Argles, *South Kensington to Robbins,* 11:308; (R) Artz, *The Development of Technical Education in France,* 11:308; *The Industrial Archaeology of Bath,* (R) 11:633; (R) Musson and Robinson, *Science and Technology in the Industrial Revolution,* 12:95; (R) Kranzberg and Davenport, eds., *Technology and Culture,* 14:474; *Industrial Archaeology in Britain,* (R) 14:618; (R) Bracegirdle, ed., *The Archaeology of the Industrial Revolution,* 15:669; (R) Woodward and Woodward, *The Secret of Sherwood Forest,* 16:306; (R) Bodey, *Twenty Centuries of British Industry,* 17:598; (R) Emmerson, *John Scott Russell,* 19:767; (R) Moss and Hume, *Workshop of the British Empire,* 20:363; *History and Industrial Civilisation,* (R) 21:652; (R) Burke, *Connections,* 22:660; (R) Penfold, ed., *Thomas Telford,* 22:792; (R) Harvey, *The Industrial Archaeology of Farming in England and Wales,* 23:242; (R) Emmerson, *The Greatest Iron Ship,* 23:510; (R) Williams, ed., *A History of Technology,* 23:631; (R) McCutcheon, *The Industrial Archaeology of Northern Ireland,* 24:673

Buchanan, R. A., and Neil Cossons, *The Industrial Archaeology of the Bristol Region,* (R) 11:633

Buchanan, R. A., and George Watkins, *The Industrial Archaeology of the Stationary Steam Engine,* (R) 19:116

Buchanan, Scott, "Technology as a System of Exploitation," 3:535
Technology ought to be redefined along lines akin to its ancient Greek meaning, that is, as the giving of rules to the arts.

Bucher, François, ed., *Architector,* (R) 22:786

Bucher, G. C.; *see* Stuhlinger, E.

Buckingham, Walter, *Automation,* (R) 3:203

Buckland, Gail, *Fox Talbot and the Invention of Photography,* (R) 25:115

Buckley, R. J., *A History of Tramways from Horse to Rapid Transit,* (R) 18:102

Bud, Robert, (R) Peebles, *Evolution of the Gas Industry,* 23:660; (R) Friedel, *Pioneer Plastic,* 25:674

Buder, Stanley, (R) McClelland, *R. A. Long's Planned City,* 19:560

Buedeler, Werner, *Geschichte der Raumfahrt,* (R) 22:816

Bugge, Thomas, *Science in France in the Revolutionary Era,* M. P. Crosland, ed., (R) 11:434

Bugliarello, George, and Dean B. Doner, eds., *The History and Philosophy of Technology,* (R) 21:534

Building a House in New France, P. N. Moogk, (R) 20:202

Building Aeroplanes for "Those Magnificent Men," A. H. Wheeler, (R) 7:112

"Building and Civil Engineering," C. W. Condit, 1:349

Building Early America: Contributions toward a History of a Great Industry, C. E. Peterson, ed., (R) 18:535

Building for Self-Sufficiency, R. Clarke, (R) 19:262

The Building of TVA: An Illustrated History, J. H. Kyle, (R) 1:189

Building the Dream: A Social History of Housing in America, G. Wright, (R) 24:283

"Building with Iron: A Napoleonic Controversy," F. H. Steiner, 22:700

Building with Nature: Roots of the San Francisco Bay Region Tradition, L. M. Freudenheim and E. Sussman, (R) 18:122

Bulferetti, Luigi, "Mario Loria (1892–1971)," 16:458
Memorial to the noted Italian engi-

neer who played a major role in the development of electric traction in Italy, then wrote its history.

———, *Gli studi italiani di storia della scienza e della tecnica nell' età contemporanea,* (R) 11:483; (R) Comune di Bologna, ed., *Macchine scuola industria dal mestiere alla professionalità,* 22:616

Bulfinch's Boston, 1787–1817, H. Kirker and J. Kirker, (R) 6:468

Bulleid: Last Giant of Steam, S. D. Lewis, (R) 6:457

Bulleit, Richard W., *The Camel and the Wheel,* (R) 19:204

Bullets and Bureaucrats: The Machine Gun and the United States Army, 1861–1916, D. A. Armstrong, (R) 25:151

Bullough, Vern L., "A Brief Note on Rubber Technology and Contraception: The Diaphragm and the Condom," 22:104

The first cheap, effective, and widely available contraceptive devices quickly followed the introduction of vulcanized rubber; cf. Pershey, 22:852.

———, "Infection and Venereal Disease," 22:853

Communication responding to Pershey, 22:852.

———, (R) Davidson, *Attic Geometric Workshops,* 3:181; (R) Noble, *The Techniques of Painted Attic Pottery,* 7:521; (R) Mercer, *Ancient Carpenters' Tools,* 17:754; (R) Durbin, ed., *A Guide to the Culture of Science, Technology, and Medicine,* 22:611; (R) Kealey, *Medieval Medicus,* 23:646

Bulmer, Martin, ed., *Working-Class Lineages of Society,* (R) 17:585

Bunge, Mario, "Technology as Applied Science," 7:329

On the nature of technological knowledge, the alleged validating power of action, the relation of technological rule to scientific law, and the effects of technological forecasts on human behavior.

———, (R) Rossi, *I filosofi e le macchine,* 7:73; (R) Habermas, *Theory and Practice,* 15:539

Burchard, John E., (R) Fitch, *Architecture and the Esthetics of Plenty,* 3:327; (R) Giedion, *The Beginnings of Art,* 5:120; (R) Schneider, *Babylon Is Everywhere,* 5:472; (R) Giedion, *The Beginnings of Architecture,* 6:267; *see also* Handlin, Oscar

Burchard, John E., and Albert Bush-Brown, *The Architecture of America,* 3:98

The Bureau of Commerce in 1781 and Its Policies with Respect to French Industry, H. T. Parker, (R) 22:625

Bureaucracy and Development: A Mexican Case Study, M. H. Greenberg, (R) 12:366

Burford, Alison, *Craftsmen in Greek and Roman Society,* (R) 17:537

Burg, David F., *Chicago's White City of 1893,* (R) 18:250

Burger, David H., (R) Erasmus, *Man Takes Control,* 3:219; (R) Fuller and McHale, *Inventory of World Resources, Human Trends, and Needs* and *The Design Initiative,* 6:504; (R) Fuller, *Comprehensive Thinking,* 7:262; (R) McHale, *The Ten Year Program,* 7:262

Burger, Henry G., "Technoculture," 2:260

Burger suggests this term to name SHOT's field of study.

———, (R) Bredo, *Industrial Estates,* 2:295

Burgess, Colin, *The Age of Stonehenge,* (R) 23:475

Burgess, E. Martin, "A Reply to Cyril Stanley Smith on Mail-making Methods," 1:151

Smith (1:60) criticized some of Burgess' findings.

Burke, James, *Connections,* (R) 22:660

Burke, John G., "Bursting Boilers and the Federal Power," 7:1

Loss of life in steamboat boiler explosions from 1816 to 1852 altered American public opinion and spurred government action, setting precedents for regulation of private enterprise; awarded the Abbott Payson Usher Prize for 1967.

———, "Let's Be Sure Technology Is for Man," 10:11

Contrary to Howland (10:1), educating engineering students broadly may not be possible, nor engineering solutions to social problems useful.

———, "The Complex Nature of Explanations in the Historiography of Technology," 11:22

Values may be more important, economic motives less, than Daniels suggests (11:1).

———, "Topics in the History of Technology," 12:241

Notes on a works-in-progress session at SHOT's 1970 Chicago meeting with papers by Asit Biswas on seventeenth-century British hydrology, Edward Ezell on arms manufacturing under the Continental Congress (1777–83) and the State of North Carolina (1862–65), Louis Gorr on Bigelow's *Elements of Technology,* Philip Spiess on machine testing at Cincinnati industrial exposi-

tions, Darwin Stapleton on the American iron industry, James Mulholland on the metallurgy of eighteenth-century microscopes, and Barton and Sally Hacker on a survey of public responses to the Apollo lunar landing.

———, "The Seminar Revisited: 1974," 16:189
Many problems Eisenman noted (16:182) were alleviated the next year.

———, "Wood Pulp, Water Pollution, and Advertising," 20:175
Modern water pollution is one cost of the coincident nineteenth-century development of advertising and improved wood pulping technology that created modern marketing techniques for mass-produced goods.

———, "New Light on the History of Chinese Technology, Science, and Medicine," 22:593
Summary of a session at SHOT's 1980 Toronto meeting with papers by Nathan Sivin on recent research in the Peoples Republic of China, James McCormick on Han medicine, and Thatcher Deane on Chinese astronomy and the exact sciences.

———, (R) Enos, *Petroleum Progress and Profits*, 4:82; (R) Smith, ed., *The Sorby Centennial Symposium on the History of Metallurgy*, 8:82; (R) Sinclair, *Early Research at the Franklin Institute*, 9:230; (R) Smith, ed., *Sources for the History of the Science of Steel*, 10:94; (R) Pacey, *The Maze of Ingenuity*, 18:86; (R) Fried and Molnar, *Technological and Social Change*, 21:540; (R) Smith, *From Art to Science* and *A Search for Structure*, 23:470

Burke, John G., and Marshall C. Eakin, eds., *Technology and Change*, (R) 22:666

Burke, Melvin, (R) Nash, *We Eat the Mines and the Mines Eat Us*, 21:545

Burke, W. Warner, ed., *New Technologies in Organization Development*, (R) 19:255

Burl, Aubrey, *Prehistoric Avebury*, (R) 21:644

Burlingame, Roger, "The Hardware of Culture," 1:11
Historiography of technology viewed through the prism of the author's pioneering experience in the field.

———, "Technology: Neglected Clue to Historical Change," 2:219
Technology has been a major cause of historical change, especially since the eighteenth century.

Burlock, Joseph, (R) Cochran, *Frontiers of Change*, 24:270

Burnett, John, *A Social History of Housing*, (R) 21:252

Burnham, Alan, (R) Kirker and Kirker, *Bulfinch's Boston*, 6:468

Burnham, Jack, *Beyond Modern Sculpture*, (R) 11:655

Burnley, James, *The History of Wool and Wool Combing*, (R) 13:495

Burns, Alfred, "Ancient Greek Water Supply and City Planning: A Study of Syracuse and Acragas," 15:389
Archaeological evidence illuminates the role of water supply in Greek city planning during the sixth and fifth centuries B.C.

Burns, Tom R., Lars Erik Karlsson, and Veljko Rus, eds., *Work and Power*, (R) 22:622

Burstall, Aubrey F., "Machinery," 1:401
Review of this subject's treatment in Singer's five-volume *History of Technology*.

———, (R) Clark, *The Development of the English Traction Engine*, 2:288; *A History of Mechanical Engineering*, (R) 5:438; (R) Kingsford, *Engineers, Inventors and Workers*, 6:276; (R) Lewis, *Bulleid*, 6:457; (R) Whitehead, *Garretts of Leiston*, 7:88; (R) Wilkes and Dodds, *Tyneside Classical*, 7:242; *Simple Working Models of Historic Machines*, (R) 11:478

"Bursting Boilers and the Federal Power," J. G. Burke, 7:1

Burstyn, Harold L., (R) Lenzen, *Benjamin Peirce and the U.S. Coast Survey*, 10:452; (R) Unesco, *Underwater Archaeology*, 15:151

Burt, Roger, ed., *Cornish Mining*, (R) 15:633; *John Taylor*, (R) 20:637

Burton, Anthony, *The Canal Builders*, (R) 24:512

Burton, Ian, and Robert W. Kates, with Lydia Burton, eds., *Readings in Resource Management and Conservation*, (R) 7:244

Burton, Lydia; *see* Burton, Ian

Busch, Jane, "Cooking Competition: Technology on the Domestic Market in the 1930s," 24:222
Electric and gas range manufacturers and utilities competed for the domestic market with product and promotional innovations.

Bush, Donald, *The Streamlined Decade*, (R) 17:779

Bush, George P., ed., *Technology and Copyright*, (R) 14:684

Bush-Brown, Joseph, (R) Condit, *American Building Art*, 3:190; *see also* Burchard, John

"Bushnell's Submarine: American Origi-

nal or European Import?" A. Roland, 18:157

Business and Government in the Oil Industry: A Case Study of Sun Oil, 1876–1945, A. W. Giebelhaus, (R) 22:651

Business and Society, J. W. McGuire, (R) 5:478

The Business Career of Moses Taylor: Merchant, Finance Capitalist and Industrialist, D. P. Hodas, (R) 19:123

Business Decisions and Technological Change, J. Diebold, (R) 12:528

Business Enterprise in Early New York, J. R. Frese and J. Judd, eds., (R) 22:189

The Business Press in America, 1750–1865, D. P. Forsyth, (R) 6:538

Busted and Still Running, E. T. Mead, Jr., (R) 11:107

Butlin, N. G., *Investment in Australian Economic Development*, (R) 6:287

Butt, John, and Ian Donnachie, *Industrial Archaeology in the British Isles*, (R) 22:303

Butti, Ken, and John Perlin, *A Golden Thread*, (R) 21:650

Buxton, N. K., and D. H. Aldcroft, *British Industry between the Wars*, (R) 22:370

Buying Aircraft: Matérial Procurement for the Army Air Forces, I. B. Holley, Jr., (R) 7:558

By Jupiter! The Life of Sir Roy Fedden, B. Gunston, (R) 21:134

By the Sweat of Their Brow: Women Workers at Victorian Coal Mines, A. V. John, (R) 23:263

By the Sweat of Thy Brow: Work in the Western World, M. Kranzberg and J. Gies, (R) 17:170

Byatt, I. C. R., *The British Electrical Industry*, (R) 21:664

Byers, Bruce K., *Destination Moon*, (R) 20:381

Bynum, W. F.; *see* Watt, J.

Byrne, Edmund, "Society for the Study of Philosophy and Technology: Chicago, April 1977," 19:100

The first part of the program addressed the adequacy of European approaches to the philosophy of technology as represented by Ellul, Marcuse, and Marx; the second part considered praxis as reflected in philosphers' participation in interdisciplinary programs.

———, (R) Pickett, ed., *Technology at the Turning Point*, 19:795

Byrnes, Robert F., (R) Lane and Kolankiewicz, eds., *Social Groups in Polish Society*, 15:349

Bythell, Duncan, *The Handloom Weavers*, (R) 11:441

The Cable Car in America, G. W. Hilton, (R) 14:640

Cableships and Submarine Cables, K. R. Haigh, (R) 10:102

Cahn, R. W., (R) Smith and Gnudi, trans., *Pirotechnia*, 8:88; (R) National Academy of Sciences, *Materials and Man's Needs*, 17:570

Cain, Louis P., "Raising and Watering a City: Ellis Sylvester Chesbrough and Chicago's First Sanitation System," 13:353

Innovations in the mid-nineteenth century created a system that met the city's needs for a century.

———, "Unfouling the Public's Nest: Chicago's Sanitary Diversion of Lake Michigan Water," 15:594

Chicago Sanitary District operations, 1889–1930, show the interaction of policy decision, bureaucracy, economy, geography, and technology in controlling pollution.

———, (R) Tarr, ed., *Retrospective Technology Assessment*, 19:725; *Sanitation Strategy for a Lakefront Metropolis*, (R) 20:813; (R) Larson, *Those Army Engineers*, 23:126

Cain, P. J., (R) Uselding, ed., *Research in Economic History*, 23:142

A Calculating People: The Spread of Numeracy in Early America, P. C. Cohen, (R) 25:875

Calder, Ritchie, "The Technical Act: Commentary," 3:516

The Industrial Revolution succeeded through such groups as the Lunar Society, but then further progress required scientific education and now requires education for control.

———, "Technology in Focus," 3:563

Scientific technology could solve all material problems of today's world; "how" requires not knowledge but intention.

———, *Living with the Atom*, (R) 4:104

Caldwell, Lawrence T., and William Diebold, Jr., *Soviet-American Relations in the 1980s*, (R) 23:691

Caldwell, Lynton K., (R) Crowther, *Science in Modern Society*, 11:335

Caley, Earle R., *Analysis of Ancient Glasses*, (R) 4:58; *Analysis of Ancient Metals*, (R) 6:650

Calhoun, Daniel H., *The American Civil Engineer*, (R) 2:61; (R) Moore, *The Professions*, 12:394; *The Intelligence of a People*, (R) 16:510

Calhoun, John C., Jr., (R) Woolrich, *Men*

of Ingenuity from beneath the Orange Tower, 7:111

The California Debris Commission: A History, J. J. Hagwood, Jr., (R) 24:534

California Institute of Technology; *see* Jet Propulsion Laboratory

"The California State Railroad Museum: A Louvre for Locomotives," J. H. White, Jr., 24:644

"A Call for a Philosophy of Engineering," G. Sinclair, 18:685

Callahan, Leslie G., (R) Fine and Remington, *The Corps of Engineers,* 15:114

Callahan, Raymond, (R) Satow and Desmond, *Railways of the Raj,* 22:811

Calvert, H. R., (R) Moseley, *Irascible Genius,* 9:122

Calvert, Monte A., (R) Naeve, ed., *Winterthur Portfolio II,* 8:406; (R) Fisher, *Workshops in the Wilderness,* 9:125; (R) Kingery et al., *Men and Ideas in Engineering,* 9:239; *The Mechanical Engineer in America,* (R) 9:496; (R) Rolt, *The Mechanicals,* 9:611; (R) Rezneck, *Education for a Technological Society,* 10:319; (R) *Winterthur Portfolio III,* 10:448; (R) Cooper, *The Invention of the Sewing Machine,* 11:449; (R) Wagoner, *The U.S. Machine Tool Industry,* 12:123

Cambridge before Darwin: The Ideal of Liberal Education, 1800–1860, M. M. Garland, (R) 24:127

Cambridge Economic History of Europe, Vol. 1, *The Agrarian Life of the Middle Ages,* M. M. Postan, ed., (R) 8:403

Cambridge Economic History of Europe, Vol. 6, pts. 1 and 2, *The Industrial Revolution and After: Population and Technological Change,* H. J. Habakkuk and M. M. Postan, eds., (R) 7:529

The Camel and the Wheel, R. W. Bulliet, (R) 19:204

Cameron, E. H., *Samuel Slater,* (R) 3:188

Cameron, Rondo E., "Technology and Industrial Development: An Assessment of David S. Landes's *Unbound Prometheus,*" 15:459
Summary of a session at SHOT's 1973 San Francisco meeting with papers by Eugene Ferguson on noneconomic motives of engineers, Robert Multhauf on pictorial evidence, and comments by Paul Uselding.

———, "The International Transfer and Diffusion of Technology," 21:462
Summary of a session at SHOT's 1979 Newark meeting with papers by Shannon Brown on China's Woosung Railway, Darwin Stapleton on American influence on European railroads, A. J. Millard on alternating current in Great Britain, and comments by Cameron.

———, *France and the Economic Development of Europe,* (R) 2:403; (R) Cipolla, ed., *The Fontana Economic History of Europe,* 15:485

Cameron, Rondo E., with Olga Crisp, Hugh T. Patrick, and Richard Tilly, *Banking in the Early Stages of Industrialization,* (R) 11:307

Campbell, Joan, *The German Werkbund,* (R) 20:392

Campbell, John F., *History and Bibliography of "The New American Practical Navigator" and "The American Coast Pilot,"* (R) 6:131

Campbell, Paul A., ed., *Medical and Biological Aspects of the Energies of Space,* (R) 3:214

Campbell-Boross, L. F.; *see* Maizels, A.

Can We Survive Our Future? G. R. Urban, ed., (R) 14:100

Canada Builds, 1867–1967, T. Ritchie, (R) 10:113

Canadian Academy of the History of Pharmacy, *One Hundred Years of Pharmacy in Canada,* (R) 11:321

"Canadian Metallurgical Technology," 6:332
Notes on a session chaired by Cyril Stanley Smith at SHOT's 1964 Montreal meeting with papers by John Convey and L. E. Djingheuzian on mineral processing since 1921, Horace Freeman on metallurgical development, J. H. Yates on the changing roles of demand and development, and W. D. Dowhaniuk on Alagoma's blast furnaces.

Canadian Steam, D. B. Morgan, ed., (R) 4:80

"Canadian Technology: British Traditions and American Influence," B. Sinclair, 20:108

The Canadian Worker in the Twentieth Century, I. Abella and D. Millar, eds., (R) 21:257

The Canal Builders, A. Burton, (R) 24:512

The Canal Builders, R. Payne, (R) 1:185

Canal or Railroad? Imitation and Innovation in the Response to the Erie Canal in Philadelphia, Baltimore, and Boston, J. Rubin, (R) 3:321

Canan, James, *The Superwarriors,* (R) 17:771

Candee, Richard, (R) Hall, ed., *A Bibliography on Vernacular Architecture,* 15:671

Candela: The Shell Builder, C. Faber, (R) 5:618

Cantelon, Philip L., and Robert C.

Williams, *Crisis Contained*, 25:667

The Cape Cod Canal, R. H. Farson, (R) 22:312

Capital et machine à vapeur au XVIII^e siècle: Les frères Perier et l'introduction en France de la machine à vapeur de Watt, J. Payen, (R) 12:635

Capital in Manufacturing and Mining: Its Formation and Financing, D. Creamer et al., (R) 3:197

Capital, Saving and Credit in Peasant Societies, R. Firth and B. S. Young, eds., (R) 6:293

Capron, William M., *Technological Change in Regulated Industries*, (R) 14:329

The Car Builder's Dictionary . . . 1879, and *1888*, M. N. Forney, (R) 13:636

The Car Builder's Dictionary . . . 1906, R. Hitt, (R) 13:636

The Car Culture, J. J. Flink, (R) 17:400

Cardew, Michael, *Pioneer Pottery*, (R) 12:331

Cardwell, Donald S. L., "Power Technologies and the Advance of Science, 1700–1825," 6:188

Convergent technologies of steam and water power led Sadi Carnot to postulate an idealized heat engine, helping lay the groundwork for thermodynamics.

———, "Science and Technology: The Work of James Prescott Joule," 17:674

Technological underpinnings of Joule's science included the Manchester engineering climate; cf. Molgaard, 20:686.

———, "Theory Loaded Terms," 20:688

Communication responding to Molgaard, 20:686.

———, (R) Watkins, *The Textile Mill Engine*, 13:76; *From Watt to Clausius*, (R) 13:315; *Turning Points in Western Technology*, (R) 14:477; (R) Gillispie, *Lazare Carnot*, 14:624; (R) Heilbron, *H. G. J. Moseley*, 16:658; (R) Smith, *Man and Water*, 18:692; (R) Tunzelmann, *Steam Power and British Industrialization to 1860*, 21:497; (R) Steffans, *James Prescott Joule and the Concept of Energy*, 22:321; (R) Hall and Smith, eds., *History of Technology*, 23:234

———, ed., *Artisan to Graduate*, (R) 17:143

Cardwell, Kenneth H., *Bernard Maybeck*, (R) 20:807

Careless, J. M. S., (R) Ritchie, *Canada Builds*, 10:113

Carl Zeiss and Ernst Abbe: Ihr Leben und ihr Werk, H. Volkmann, (R) 9:235

Carleton, William G., *Technology and Humanism*, (R) 12:536

Carlson, Einar W.; *see* Howell, Kenneth T.

Carlson, Eric T., (R) Flaherty, ed., *Psychophysiological Aspects of Space Flight*, 2:433; (R) Campbell, ed., *Medical and Biological Aspects of the Energies of Space*, 3:214

Carlson, Robert E., (R) Fogel, *The Union Pacific Railroad*, 2:405; (R) Simmons, *The Railways of Britain*, 3:317; (R) Parris, *Government and the Railways in Nineteenth-Century Britain*, 8:99; (R) Clark, *A Short History of the Midland & Great Northern Joint Railway*, 9:233; *The Liverpool and Manchester Railway Project*, (R) 11:628; (R) Cottrell, *Technological Change and Labor in the Railroad Industry*, 12:113; (R) Rolt, *The Making of a Railway*, 13:318; (R) Simmons, *The Birth of the Great Western Railway*, 13:500; (R) von Oeynhausen and von Dechen, *Railways in England*, 13:635; (R) Christiansen, *The West Midlands*, 16:97; (R) Davis, *End of the Line*, 20:228

Carlson, Stephen P., and Fred W. Schneider III, *PCC*, (R) 23:506

Carlson, W. Bernard, (R) Bennett, *A History of Control Engineering*, 23:657; (R) Cheney, *Tesla*, 24:140; (R) Kurylo and Süsskind, *Ferdinand Braun*, 25:116

Carmichael, Leonard, (R) Arendt, *The Human Condition*, 1:177; (R) Anderson, ed., *Creativity and Its Cultivation*, 2:89; (R) Scheller, *Ressentiment*, 3:228

Carovillano, Robert L., and James W. Skehan, eds., *Science and the Future of Man*, (R) 13:331

Carozzi, Albert V., (R) Biswas, *History of Hydrology*, 12:493

Carpenter, Kenneth E., "European Industrial Exhibitions before 1851 and Their Publications," 13:465

Bibliographical survey of national exhibitions during the first half of the nineteenth century.

Carpenter, Stanley R. "Developments in the Philosophy of Technology in America," 19:93

A symposium at the Chicago meeting of the Philosophy of Science Association in October 1976 wondered if technology posed any philosophically interesting questions, to which the answer was a resounding yes; in December, the Boston meeting of the American Philosophical Association's eastern division included a session on the problem of distinguishing modern from earlier technological modes.

———, (R) Ferkiss, *The Future of Technological Civilization*, 16:696; (R) Winner,

Autonomous Technology, 19:142; (R) Clarke, *Building for Self-Sufficiency*, 19:262; *see also* Porter, Alan

Carr, J. C., and W. Taplin, with A. E. G. Wright, *A History of the British Steel Industry*, (R) 4:352

Carr, R. J. M., (R) Briggs, *The Power of Steam*, 24:514; (R) Binnie, *Early Victorian Water Engineers*, 25:895

The Carriage and Harness Museum, J. S. Guldbeck, (R) 15:537

Carriage Terminology: An Historical Dictionary, D. H. Berkebile, (R) 21:116

Carrier Admiral, J. J. Clark, (R) 9:505

Carroll, Charles F., *The Timber Economy of Puritan New England*, (R) 15:494

Carroll, P. Thomas, [Works-in-progress,] 22:595

Summary of a session at SHOT's 1980 Toronto meeting with papers by Rachel Laudan on the professionalization of mineral surveyers in the Industrial Revolution, Paul Israel on primary sources for Edison's electric light, Robert Rosenberg on early electrical engineering at Johns Hopkins, Donald Hoke on women and typewriters, and Margaret Rossiter on the changing meaning of "stereotype."

Carstens, Harold H., ed., *Loco 1*, (R) 9:616

Carter, Anne P., *Structural Change in the American Economy*, (R) 12:511

Carter, Edward T., and Angelina Polites, eds., *The Virginia Journals of Benjamin Henry Latrobe*, (R) 20:226

Carter, Harry, *A View of Early Typography*, (R) 12:342

Cartwright, Frederick F., *A Social History of Medicine*, (R) 19:764

Carver, J. Scott, "*Tekhnologicheskii zhurnal*: An Early Russian Technoeconomic Periodical," 18:622

The officially sanctioned economic journal, 1804–1826, was closely attuned to sociopolitical ideals and cultural values.

———, (R) Dewdney, *Studies in Industrial Geography*, 20:384

Carver, Kaye, and Myra Queen, eds., *Memories of a Mountain Shortline*, (R) 18:553

Carver, Scott, (R) Korneyer, ed., *USSR Academy of Sciences*, 19:769

"Case Studies in Anonymous Technology," B. Hindle, 24:477

"Case Studies in the History of Contemporary Technology," 8:314

Notes on a session chaired by Bern Dibner at SHOT's 1966 Washington meeting with papers by Loyd Swenson on Project Mercury, Ralph Sanders on the army's new main battle tank, and Wayne Rsmussen on the mechanical tomato picker.

A case study of the history of the incandescent lamp, 1830–1940: From scientific research to industrial production [in Hungarian], T. Balázs, (R) 7:534

Casey, Louis S., *The First Nonstop Coast-to-Coast Flight and the Historic T-2 Airplane*, (R) 6:666

Casey, William L., Jr., (R) Kemeny, *Man and the Computer*, 14:665; (R) Beer, *Brain of the Firm*, 15:129

Cassidy, David F.; *see* Foley, Vernard

Cassier's Magazine, Engineering Monthly, 1891-1913: Subject Index, E. S. Ferguson, comp., (R) 6:538

Casson, Lionel, *Ships and Seamanship in the Ancient World*, (R) 13:67; (R) Pope, *The Story of Archaeological Decipherment*, 17:530; (R) Boczar, *Galeona Zygmunta Augusta*, 17:790

"Cast-Iron Aqueduct in Rees's *Cyclopaedia*," E. S. Ferguson, 9:597

"The Cast-Iron Bells of China," W. Rostoker et al., 25:750

Castles and Cannon: A Study of Early Artillery Fortifications in England, B. H. St. J. O'Neil, (R) 3:91

Catalog of Meteorological Instruments in the Museum of History and Technology, W. E. K. Middleton, (R) 11:488

Catalog of the Inland Rivers Library, C. N. Bowden, comp., (R) 11:130

Catalogue of Armor: The John Woodman Higgins Armory, S. V. Grancsay, (R) 3:182

A Catalogue of Instruments and Models in the Possession of the American Philosophical Society, R. P. Multhauf, comp., (R) 3:184

A Catalogue of Tools for Watch and Clock Makers, J. Wyke, (R) 21:495

Catapano, Fred T., (R) Berman, *An Essay on Church Clocks*, 17:135

Cate, James Lee, [The Apollo project,] 12:250

Notes on a session at SHOT's 1970 Chicago meeting with papers by Cargill Hall on space science and unmanned spaceflight, John Beltz on Saturn rockets, Loyd Swenson on the Apollo spacecraft, and comments by John Logsdon.

"The Cathedral and the Bridge: Structure and Symbol," D. P. Billington and R. Mark, 25:37

Catling, H., *The Spinning Mule*, (R) 16:88

Cattell, James McKeen, *An Education in Psychology*, (R) 25:374

The Causes of Wealth, J. Fourastié, (R) 2:262
The Cavendish Laboratory, 1874–1974, J. G. Crowther, (R) 16:655
"Cavour and the Development of the Fertilizer Industry in Piedmont," M. Loria, 8:159
Caws, Peter, (R) Niblett, ed., *The Sciences, the Humanities, and the Technological Threat*, 18:515
"The Celestial River: A Reconstruction," A. W. Sleeswyk, 19:423
Censer, Jack R., (R) Sigaut, *Les Réserves de grains à long terme*, 21:114
"Centennial Celebrations: Two Exhibits Commemorating the 100th Anniversary of the Brooklyn Bridge," D. J. Jackson, 25:287
A Centennial History of the American Society of Mechanical Engineers, 1880–1980, B. Sinclair, (R) 23:678
Central Electric Railfans' Association, *Electrification by GE*, (R) 18:554
Central Planning in Czechoslovakia: Organization for Growth in a Mature Economy, J. M. Michal, (R) 2:426
Central Road Research Institute, *History of Road Development in India*, (R) 6:301
Centre de documentation d'histoire des techniques, *Documents pour l'histoire des techniques*, (R) 4:51; *Etudes pour un traitement automatique des sources en histoire des techniques*, (R) 17:410
Centre de recherche sur la culture technique, *Culture technique*, (R) 24:504
"The Centre for the Study of the History of Technology, Bath University of Technology, England," R. A. Buchanan, 9:430
Centro per la storia della tecnica in Italia, Consiglio nazionale delle ricerche, *Guerra e commercio nell'evoluzione della marina genovese tra XV e XVII secolo*, (R) 16:289
A Century of British Aeronautics: The Centenary Journal of the Royal Aeronautical Society, 1866–1966, (R) 10:323
A Century of Cameras: From the Collection of the International Museum of Photography at George Eastman House, E. S. Lothrop, (R) 18:231
A Century of Chemical Engineering, W. F. Furter, ed., (R) 25:370
A Century of Chemistry: The Role of Chemists and the American Chemical Society, American Chemical Society, (R) 19:127
A Century of Oil and Gas in Books: A Descriptive Bibliography, E. B. Swanson, comp., (R) 5:134
Cepede, Michele, François Houtart, and Linus Grond, *Population and Food*, (R) 6:492
"Ceramics and Glass," H. J. Haden, 1:364
Ceramics in America (Winterthur Conference Report, 1972), I. M. G. Quimby, ed., (R) 15:493
Cerchione, Angelo J., Victor E. Rothe, and James Vercellina, *Master Planning the Aviation Environment*, (R) 14:656
Ceruzzi, Paul, (R) Wexelblat, ed., *History of Programming Languages*, 25:144
Cervera Vera, Luis, *El "ingenio" creado por Juan de Herrara para cortar hierro*, (R) 16:293
Cesari, Gene S., (R) Woolf, ed., *Science as a Cultural Force*, 6:683; (R) Jarrett, ed., *Environmental Quality in a Growing Economy*, 8:523; (R) Schmookler, *Invention and Economic Growth*, 10:127; (R) Aron, *Progress and Disillusion*, 10:478; (R) Warner et al., eds., *The Environment of Change*, 11:652
Cetron, Marvin J., *Technological Forecasting*, (R) 11:659; *see also* Davidson, Harold F.
Chadwick, Edwin, *Report on the Sanitary Conditions of the Labouring Population of Great Britain*, M. W. Flinn, ed., (R) 8:225
Chafe, William H., *The American Woman*, (R) 16:322
Chaffee, Steven; *see* Comstock, George
The Challenge of the Computer Utility, D. F. Parkhill, (R) 8:515
The Challenge Presented to Cultures by Science and Technology, J. Ladrière, (R) 21:710
Challenge to Reason, C. W. Churchman, (R) 11:127
The Challenges of Space, H. Odishaw, ed., (R) 5:265
The Chamber of Physics: Instruments in the History of Sciences Collections of the Royal Swedish Academy of Sciences, Stockholm, G. Pipping, (R) 20:631
Chamberlain, Von Del, *When the Stars Came Down to Earth*, (R) 25:873; *see also* Hanle, Paul A.
Chamberlain, William H. J., (R) Cope, *Stevens Pistols and Pocket Rifles*, 13:321; (R) Sellers and Smith, *American Percussion Revolvers*, 13:321; (R) Huntington, *Hall's Breechloaders*, 14:86; (R) Ezell, ed., *Small Arms of the World*, 19:758
Chamberlain, William H. J., and A. W. F. Taylerson, *Adams' Revolvers*, (R) 21:518
Chambers, David Wade, ed., *Liberation and Control*, (R) 24:548
Chanaron, Jean-Jacques; *see* Bardou, Jean-Pierre
Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology, J. Monod, (R) 13:662
Chandler, Alfred D., Jr., *Strategy and*

Structure, (R) 5:107; *Giant Enterprise*, (R) 6:284; (R) Aitken, ed., *Explorations in Enterprise*, 7:434; (R) Jenkins, *Images and Enterprise*, 18:107; (R) Noble, *America by Design*, 19:569

Chandler, Alfred D., Jr., and Herman Daems, eds., *Managerial Hierarchies*, (R) 23:140

Chandler, Bruce; *see* Cosman, Madeleine

Chang, Tien S., (R) Needham, *The Development of Iron and Steel Technology in China*, 2:170

Change and Continuity in India's Villages, K. Ishwaran, (R) 13:95

Change and Habit: The Challenge of Our Time, A. J. Toynbee, (R) 9:102

Change at Park Street Under: The Story of Boston's Subways, B. J. Cudahy, (R) 14:642

Change in Agriculture: The Northern United States, 1820–1870, C. H. Danhof, (R) 12:105

Change in Communist Systems, C. Johnson, ed., (R) 12:521

The Changing Information Environment, J. McHale, (R) 20:677

"The Changing Nature of Technological Systems: America, 1870–1940," E. W. Constant II, 24:475

Changing Organizations, W. G. Bennis, (R) 8:143

Changing Perspectives on Man, B. Rothblatt, ed., (R) 11:466

The Changing Structure of the Western Economy, D. Copland, (R) 6:291

"Changing Styles in 'Best Practice Museology,' " J. T. van Riemsdijk, 19:606

"The Changing Technical Act," A. R. Hall, 3:501

The Changing World Market for Iron Ore, 1950–1980, G. Manners, (R) 13:650

Channell, David F., "Interdisciplinary Perspectives on the History of Technology," 21:456

Summary of a session at SHOT's 1979 Newark meeting with papers by Channell and David Lewis on technology and the sacred, Robert Mark and Harold Dorn on Christopher Wren, Arthur Donovan on coal and American industrialization, and Edward Daub on biomedical technology.

———, "The Harmony of Theory and Practice: The Engineering Science of W. J. M. Rankine," 23:39

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Dalrymple, Dana G., "The American Tractor Comes to Soviet Agriculture: The Transfer of a Technology," 5:191
A thousand tractors in 1924 Russia multiplied by 1924 to 200,000, mostly of U.S. design if not U.S. manufacture.

———, "The Development of Agricultural Technology: Controlled-Atmosphere Storage of Fruit," 10:35
Intensive research in Great Britain began in the 1920s using basic concepts then already a century old, but U.S. commercial development began only in the 1950s.

———, (R) Southworth and Johnston, eds., *Agricultural Development and Economic Growth*, 11:111; (R) Frankel, *India's Green Revolution*, 13:330; *see also* Arndt, Thomas M.

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Damals als die Pferde scheuten: Die Geschichte der österreichischen Kraftfahrt, H. Seper, (R) 12:659

Dams and Other Disasters: A Century of the Army Corps of Engineers, A. E. Morgan, (R) 13:645

Dams, Parks, and Politics: Resource Development and Preservation in the Truman-Eisenhower Era, E. Richardson, (R) 16:101

Dane, E. Surrey, *Peter Stubs and the Lancashire Hand Tool Industry*, (R) 16:299

Danhof, Clarence H., *Change in Agriculture*, (R) 12:105; *Government Contracting and Technological Change*, (R) 13:96

Daniel, Pete, (R) Cobb, *The Selling of the South*, 24:521

"Daniel Farrand Henry's Cup Type 'Telegraphic' River Current Meter," A. H. Frazier, 5:541

Daniels, Farrington, *Direct Use of the Sun's Energy*, (R) 6:501

Daniels, George, *Watchmaking*, (R) 24:545; *see also* Clutton, Cecil

Daniels, George H., "The Big Questions in the History of American Technology," 11:1
They center on technology as social phenomenon and the distinctive characteristics of American technology; cf. comments by Burke (11:22) and Layton (11:27).

———, "The Reply: Differences and Agreements," 11:32
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———, *American Science in the Age of Jackson*, (R) 10:101; (R) Hughes, *Elmer Sperry*, 13:326; *Science in American Society, (R)* 13:666; (R) DeVore, *Technol-*

ogy, 22:608; (R) Lokken, ed., *Meet Dr. Franklin,* 23:120; (R) Lindqvist, *The Teaching of History of Technology in USA,* 24:122

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The symposium probed energy and transportation as they related to each other and as they interacted with other American institutions during the nineteenth and twentieth centuries.

———, eds., *Energy and Transport,* (R) 25:362

Daniels, Roger, "Concerning *Vanguard of Expansion,*" 24:258

Communication objecting to the review by Goetzmann, 22:125; cf. Goetzmann, 24:260.

Danilevskii, V. V., *Nartov and His Theatrum Machinarum,* (R) 10:96

Dankert, Clyde E., Floyd C. Mann, and Herbert R. Northrup, eds., *Hours of Work,* (R) 7:438

Danko, George M., (R) Ruddock, *Arch Bridges and Their Builders,* 21:241; (R) Slaski, *Poorly Marked and Worse Lighted,* 22:311

The Darbys and the Ironbridge Gorge, B. Bracegirdle and P. H. Miles, (R) 16:483

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"The 'Darkhouse' of Alexandria," L. S. de Camp, 6:423

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Technology and education being interdependent, changes in either must alter the other; abstract of a paper from the conference, "Technology and the Idea of Mankind," 5:43, with a summary of the discussion that followed.

David, Paul A., *Technical Choice, Innovation, and Economic Growth,* (R) 17:380

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Responding to Battison, 7:202, with evidence for Besson's Protestantism.
———, *Society and Culture in Early Modern France,* (R) 17:368
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Davis, Robert C., "The Brass Age of Psychology," 11:604
Review of the Laboratory Instruments Exhibit of the Archives of the History of American Psychology.
———, "Mass Communications," 12:443
Notes on a session at SHOT's 1971 New York meeting with papers by Herbert Schiller on opinion polling, Stuart Umpleby on computers and citizen policy-making, and comments by Robert Chandler.
———, (R) McClelland, *The Achieving Society,* 3:351; (R) Filler, *A Dictionary of American Social Reform,* 5:125; (R) Unesco, *Social Science Organization and Policy,* 16:321
Davison, C. St. C., "Transporting Sixty-Ton Statues in Early Assyria and Egypt," 2:11
Neither Assyrians nor Egyptians used rollers, as usually assumed, but Egyptians apparently moved heavy statues by lubricating large, flat boards.
Davison, Stanley S., *The Leadership of the Reclamation Movement,* (R) 24:713
Dawley, Alan, *Class and Community,* (R) 18:545
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Day, C. R., (R) Cipolla, ed., *Instruction et développement économique au XIX^ème siècle,* 15:518
Day, John, *The Bosch Book of the Motor Car,* (R) 18:110
Day, Richard B., *Leon Trotsky and the Politics of Economic Isolation,* (R) 15:652
Day of Trinity, L. Lamont, (R) 7:250
D-Day on the Western Pacific: A Railroad's Decision to Dieselize, V. Staff, (R) 24:524
DDT: Scientists, Citizens, and Public Policy, T. R. Dunlap, (R) 23:490
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de Camp, L. Sprague, "Master Gunner Apollonios," 2:240
Evidence that torsion catapults had largely replaced flexion by the end of the fourth century B.C.
———, "An Early Patent-Law Proposal?" 5:337
A passage in Aristotle's *Politics* suggested that Hippodamos of Miletos may have proposed something like a patent law in the fifth century B.C.
———, "Custom and Innovation," 5:595
An example of resistance to innovation in a Guatemalan village.
———, "The 'Darkhouse' of Alexandria," 6:423
Arguments pro and con that the Pharos of Alexandria began as a lighthouse, with a new piece of evidence for the "light" side.
———, "The Unsinkables," 10:422
Classical Mediterranean ships would not sink when wrecked unless bearing a dense, heavy cargo, which may explain why underwater archaeology has yet to find a single ancient war galley.
———, (R) Vaughan, *The House of the Double Axe,* 2:53; *The Heroic Age of American Invention,* (R) 3:95; (R) Fakhry, *The Pyramids,* 4:54; (R) Kunkel, *Pharaoh's Pump,* 4:56; *The Ancient Engineers,* (R) 5:69; (R) Matthews, *Mazes and Labyrinths,* 11:464; (R) Casson, *Ships and Seamanship in the Ancient World,* 13:67; (R) Brown and Jeffcott, *Absolutely Mad Inventions,* 13:525; (R) Magnusson, *Viking Expansion Westwards,* 15:484; (R) Marx, *The Lure of Sunken Treasure,* 15:538; (R) Rottensteiner, *The Science Fiction Book,* 17:781; (R) Landels, *Engineering in the Ancient World,* 19:728; (R) Dicks, *The Ancient Persians,* 20:789
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De France, Smith J., (R) Gablehouse, *Helicopters and Autogiros,* 9:249
De Gelder, Willem, *A Dutch Homesteader on the Prairies,* H. Ganzevoort, ed. and trans., (R) 15:499
de Grazia, Sebastian, *Of Time, Work, and Leisure,* (R) 4:370
De Gregori, Thomas R., "Science and Technology for Development," 6:636
Essay review of the eight-volume report of the U.N. Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas.
———, "Technology: Nuts and Bolts or Social Process?" 12:254

Notes on a series of sessions at SHOT's 1970 Chicago meeting beginning with showing of the films *Salt of the Earth* and *A nous la liberté* with related discussion by Anthony Leeds, De Gregori, Gene Walsh, and James Boggs. Next came "Material and Non-material Culture of Technology," with papers by Milton Lower on management and economic institutions, Paul Strassmann on advanced technology in underdeveloped countries, Eugene Ferguson on technological enthusiasm, and comments by Louis Junder. The next session—"Techno-Social Change: Pattern or Causality?"—included papers by Anthony Leeds on technology and society, De Gregori on technological habits, and comments by Tom Esper. The final panel, "Approaches to the Understanding of Technology," included George Basalla on technological utopianism in museums, Barry Commoner on technological concepts and uses, David Hamilton on traditional versus evolutionary views of technology in economics, James Blaut on technology and underdevelopment, and comments by Paul Sears.

———, "Queries on Economic Rationality," 16:460

Correction and expansion of De Greogori's review of Hopkins, 15:514; cf. Hopkins's response, 16:462.

———, "The Back-to-Nature Movement: Alternative Technologies and the Inversion of Reality," 23:214

Contrary to Bryant, 21:227, the human environment is fundamentally technological.

———, (R) Salisbury, *From Stone to Steel*, 5:272; (R) Barnett and Morse, *Scarcity and Growth*, 6:506; (R) Yudelman, *Africans on the Land*, 6:509; (R) *First* and *Second International Conference of Economic History*, 8:219; (R) Kuznets, *Modern Economic Growth*, 8:419; (R) Ginzberg and Smith, *Manpower Strategy for Developing Countries*, 9:269; (R) Spencer and Woroniak, eds., *The Transfer of Technology to Developing Countries*, 9:631; (R) Strassmann, *Technological Change and Economic Development*, 10:130; (R) Baranson, *Technology for Underdeveloped Areas*, 10:133; (R) Ribeiro, *The Civilizational Process*, 11:667; (R) Hetzler, *Technological Growth and Social Change*, 12:145; (R) Hoelscher and Hawk, eds., *Industrialization and Development*, 12:362; *Technology and the Economic Development of the Tropical African Frontier*, (R) 12:363; (R) Maquet, *Civilizations of Black Africa*, 14:96; (R) Peil, *The Ghanaian Factory Worker*, 14:517; (R) Kay, *The Political Economy of Colonialism in Ghana*, 14:517; (R) Ekundare, *An Economic History of Nigeria*, 15:150; (R) Hopkins, *An Economic History of West Africa*, 15:514; (R) Hogg, *The African Slave Trade and Its Suppression*, 15:516; (R) Hetzler, *Applied Measures for Promoting Technological Growth*, 15:517; (R) Unesco, *Cultural Policy in the Philippines*, 16:320; (R) M'Bengue, *Cultural Policy in Senegal*, 16:320; (R) Unesco, *Cultural Policy in Indonesia*, 16:320; (R) Michman, *Cultural Policy in Israel*, 16:320; (R) Unesco, *Cultural Policy in the Federal Republic of Germany*, 16:320; (R) Smyth, *The Role of Culture in Leisure-Time in New Zealand*, 16:320; (R) Lewicki, *West African Food in the Middle Ages*, 16:627; (R) Dark, *An Introduction to Benin Art and Technology*, 16:701; (R) Unesco, *Science and Technology in African Development*, 17:182; (R) Curtin, *Economic Change in Pre-colonial Africa*, 17:406; (R) Smaldone, *Warfare in the Sokoto Caliphate*, 18:730; (R) Leonard, *Reaching the Peasant Farmer*, 19:547; (R) Lewis, *The Evolution of the International Economic Order*, 20:225; (R) Korbin, *Foreign Direct Investment, Industrialization, and Social Change*, 20:662; (R) Uselding, ed., *Research in Economic History*, 21:521; (R) Morgan et al., *Science and Technology for Development*, 21:544; (R) Long and Oleson, eds., *Appropriate Technology and Social Values*, 22:680; (R) Feather, ed., *Through the '80s*, 22:691; (R) Brockway, *Science and Colonial Expansion*, 22:809; (R) Hohenemser and Kasperson, eds., *Risk in the Technological Society*, 24:311; (R) Rittberger, ed., *Science and Technology in a Changing International Order*, 25:315; (R) Shemilt, ed., *Chemistry and World Food Supplies*, 25:675; (R) Anderson et al., eds., *Science, Politics, and the Agricultural Revolution in Asia*, 25:676; (R) International Development Research Centre, *Absorption and Diffusion of Imported Technology*, 25:871; *see also* Pi-Sunyer, Oriol

De Gregori, Thomas R., and Oriol Pi-Sunyer, "Technology, Traditionalism, and Military Establishments," 7:402

Essay review of *The Liddell Hart Memoirs*.

de Havilland, Geoffrey, *Sky Fever*, (R) 4:99

de Jong, Cornelis; *see* Schmitt, Frederick P.

de la Croix, Horst, "The Literature on

Fortification in Renaissance Italy," 4:30
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Deane, Phyllis, and W. A. Cole, *British Economic Growth,* (R) 4:350
Deasy, John, (R) Herken, *The Winning Weapon,* 25:666
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Dechen, H. von; *see* Oeynhausen, C. von
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Degan, James; *see* Bennett, Edward
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Design on the Land: The Development of Landscape Architecture, N. T. Newton, (R) 13:653
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The Development of Modern Chemistry, A. J. Ihde, (R) 7:235
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———, "Ladislao Reti (1901–1973)," 15:440

Memorial to the industrialist who became a foremost authority on Leonardo da Vinci and recipient of SHOT's Leonardo da Vinci Medal.

———, "First Martyr of Electricity," 17:743

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———, "Elmer Belt (1893–1980)," 22:837

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———, " 'Matkel' or 'Mackel,' " 6:444

Defense of using the misspelling in the title above.

———, "Dyeing Fabrics in Sixteenth-Century Venice," 7:395

Gioanventura Rosetti's *Plictho de larte de tentori* (1548) was the first published technical manual on dyeing for professional dyers.

———, *Historical Notes on the Wet-processing Industry*, (R) 15:328

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Edge, David O., (R) De Vorkin, *The History of Modern Astronomy and Astrophysics*, 25:135; *see also* Barnes, Barry

Edge, David O., and Michael J. Mulkay, *Astronomy Transformed*, (R) 19:580

"Edinburgh and Medicine," R. H. Nuttall, 18:666

Edison: A Biography, M. Josephson, (R) 1:284

"Edison in Combat: Inventors in Competition," J. E. Brittain, 21:448

The Edison Motion Picture Myth, G. Hendricks, (R) 3:335

"Edison's Impact on Contemporary Industry—a Sampling," L. S. Reich, 21:449

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Edson, Lee; *see* Kármán, Theodore von

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política educativa, Ministerio de educatión y ciencia, (R) 11:113

Education and the Industrial Revolution, E. G. West, (R) 17:377

Education for a Technological Society: A Sesquicentennial History of Rensselaer Polytechnic Institute, S. Rezneck, (R) 10:319

An Education in Psychology: James McKeen Cattell's Journals and Letters from Germany and England, 1880–1888, M. M. Sokal, ed., (R) 25:374

Education, Manpower, and Economic Growth: Strategies of Human Resource Development, F. Harbison and C. Myers, (R) 6:157

Edwards, Charles E., "Boyd on Kettering and Leland," 9:592

Comments on Boyd, 9:585, about credit for inventing the electric starter.

———, *Dynamics of the United States Automobile Industry*, (R) 7:549; (R) Leland, *Masters of Precision*, 8:503; (R) White, *The Automobile Industry since 1945*, 13:510

Edwards, R. W.; *see* Goodman, Gordon T.

"Effects Precede Causes," J. Owens, 14:19

Efficiency and Uplift: Scientific Management in the Progressive Era, 1890–1920, S. Haber, (R) 6:307

Efremtsev, G. P., *Istoriia Kolomenskogo zavoda*, (R) 16:643

"The Egyptian Drill and the Origin of the Crank," R. S. Hartenberg and J. Schmidt, Jr., 10:155

Ehrenreich, Barbara, and John Ehrenreich, *The American Health Empire*, (R) 13:333

Ehrenreich, John; *see* Ehrenreich, Barbara

Ehrhart, Gustav; *see* Baumler, Ernst

Ehrhart, Robert C.; *see* Hurley, Alfred F.

Ehrlich, Richard L., (R) Shepherd and Walton, *Shipping, Maritime Trade, and the Economic Development of Colonial North America*, 14:626; (R) Beynon and Blackburn, *Perceptions of Work*, 15:527

Eichberg, Henning, *Militär und Technik*, (R) 19:554

Eicher, Carl K., and Lawrence Witt, eds., *Agriculture in Economic Development*, (R) 6:137

Eichner, L. C., "The Cooling Pit of Filarete's Smelter," 5:404

Why running molten iron into a pool of water would not produce an explosion, a problem raised in Spencer, 4:201.

"Eighteenth-Century Agriculture: A Symposium," special issue of *Agricultural History*, vol. 43, no. 1, (R) 11:301

Eighteenth-Century Gunfounding: The Verbruggens at the Royal Brass Foundry, M. J. Jackson and C. de Beer, (R) 17:136

Eighteenth-Century Prints of Colonial America: To Educate and Decorate, J. D. Dolmetsch, ed., (R) 21:110

"Eilmer of Malmesbury, an Eleventh Century Aviator: A Case Study of Technological Innovation, Its Context and Tradition," L. White, jr., 2:97

Einstein: A Centenary Exhibition, National Museum of History and Technology, ed., (R) 21:693

Eisen und Kohle für das Dritte Reich: Paul Pleigers Stellung in der NS-Wirtschaft, M. Riedel, (R) 16:649

Die Eisen- und Stahlindustrie des Ruhrgebiets, W. Feldenkirchen, (R) 25:647

Eisenberg, Peter L., *The Sugar Industry in Pernambuca*, (R) 16:318

Eisenbud, Merril, *Environmental Radioactivity*, (R) 5:101; *Environment, Technology, and Health*, (R) 21:272

Eisenman, Harry J., "The Brush Double-Arc Lamp," 7:511

Charles Francis Brush (1849–1929) developed the lamp in 1880 as part of a successful system of commercial arc lighting; it featured gravity feed and solenoid action to regulate spacing of the burning carbons.

———, "Technology, Society, and Values in 20th-Century America: The UCLA Summer Seminar," 16:182

Critique of a course; cf. the reply by Burke, 16:189.

———, "National Museum of Transport," 17:93

Impressive for its collection of artifacts, especially railroad, the St. Louis museum lacks enclosed display space and adequate funds.

———, (R) Opper, *Science and the Arts*, 16:124; (R) Lind, *From Horsecars to Streamliners*, 21:118; (R) Rothenberg, *The Emerging Goddess*, 21:689

Eisenmenger, Robert W., *The Dynamics of Growth in New England's Economy*, (R) 9:606

Eisenstein, Elizabeth, *The Printing Press as an Agent of Change*, (R) 20:793

Eklund, Jon, *The Incompleat Chymist*, (R) 18:95

Ekonomicheskoe polozhenie Rossii v gody pervoi mirovoi voiny [The economic position of Russia in the years of the First World War], A. L. Sidorov, (R) 17:390

Ekonomika SSSR v gody Velikoi Otechestvennoi voiny (1941–1945 gg.) [The economy of the USSR in the years of the Great Fatherland War (1941–1945)], G. S. Kravchenko; (R) 15:122

Ekundare, R. Olufemi, *An Economic*

History of Nigeria, (R) 15:150
Elbers, Gerald W., and Paul Duncan, eds., *The Scientific Revolution,* (R) 2:88
Elder, Albert E., ed., *The History of Penicillin Production,* (R) 12:355
The Electric Interurban Railways in America, G. W. Hilton and J. F. Due, (R) 2:284
Electric Railway Dictionary, R. Hitt, (R) 14:306
The Electric Telegraph: A Social and Economic History, J. L. Keive, (R) 15:332
Electric Traction on the Pennsylvania Railroad, 1895–1968, M. Bezilla, (R) 22:637
"Electrical Engineering," T. J. Higgins, 1:408
"Electrical Technology, 1870–1900," O. Mayr, 12:238
"Electricity and Ideology," D. A. Hounshell, 18:482
Electricity before Nationalisation: A Study of the Development of the Electricity Supply Industry in Britain to 1948, L. Hannah, (R) 21:254
Electricity for Rural America: The Fight for the REA, D. C. Brown, (R) 22:315
Electrification by GE, Central Electric Railfans' Association, (R) 18:554
"The Electrification of America: The System Builders," T. P. Hughes, 20:124
The electrification of Swedish railways: Motives for choice of systems [in Swedish], G. Rönn, (R) 22:194
Electrochemistry: History and Theory, W. Ostwald, (R) 24:125
[Electronic computer history,] J. G. Brainerd, 22:572
Electronics, Editors of, *An Age of Innovation,* (R) 23:128
Electronics in the West: The First Fifty Years, J. Morgan, (R) 11:320
"Elegant Inventions: The Artistic Component of Technology," E. S. Ferguson, 19:450
Elektrifieringen av svenska järnvägar: Motiv för val av system [The electrification of Swedish railways: Motives for choice of systems], G. Rönn, (R) 22:194
Elektrische Spielereien im Barock und Rokoko, F. Fraunberger, (R) 10:100
Eli Terry and the Connecticut Shelf Clock, K. D. Roberts, (R) 18:695
Eli Whitney Armory Survey (CT-2), Historic American Engineering Record, (R) 18:146
Elihu Thomson: Beloved Scientist, D. O. Woodbury, (R) 2:419
"Elisha Gray and the Telephone: On the Disadvantages of Being an Expert," D. A. Hounshell, 16:133
"Elisha K. Root, Forging, and the 'American System,' " P. Uselding, 15:543
Elizabethan Military Science: The Books and the Practice, H. J. Webb, (R) 7:420
Elkana, Yehuda; *see* Holton, Gerald
Elliott, Clark A., *Biographical Dictionary of American Science,* (R) 21:512
Elliott, Philip, *The Sociology of the Professions,* (R) 15:524
Elliott, Ward, (R) Harrison, *Who Pays for Clean Air,* 18:135
Ellis, John, *The Social History of the Machine Gun,* (R) 18:262
Ellsworth, Lucius F., (R) Boorstin, *The Americans,* 17:385
Ellsworth, Lucius F., and Maureen A. O'Brien, eds., *Material Culture,* (R) 11:661
Ellul, Jacques, "The Technological Order," 3:394
A human milieu more technical than natural poses a social problem with answers ultimately ethical or spiritual, although technology in itself can be neither good nor bad.
———, *The Technological Society,* (R) 6:532; *The Technological System,* (R) 23:81
"Elmer Belt (1893–1980)," B. Dibner, 22:837
Elmer Sperry: Inventor and Engineer, T. P. Hughes, (R) 13:326
Elsner, Henry, Jr., *The Technocrats,* (R) 9:256
Elton, Julia, ed., *Bridges, Docks and Harbours with Related Works,* (R) 24:710
Elvin, Mark, *The Pattern of the Chinese Past,* (R) 15:511
The Emergence of Agricultural Science: Justus Liebig and the Americans, 1840–1880, M. W. Rossiter, (R) 17:755
The Emergence of an Industrial Labor Force in India: A Study of the Bombay Cotton Mills, 1854–1947, M. D. Morris, (R) 9:137
"The Emergence of Basic Research in the Bell Telephone System, 1875–1915," L. Hoddeson, 22:512
The Emergence of Civilization: The Cyclades and the Aegean in the Third Millenium, B.C., C. Renfrew, (R) 14:78
The Emergence of Industrial America: Strategic Factors in American Economic Growth since 1870, P. George, (R) 25:662
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The Emergence of Society: A Prehistory of the Establishment, J. E. Pfeiffer, (R) 19:509
"The Emergence of the Modern Capital Ship," S. Sandler, 11:576
The Emerging Goddess: The Creative Process in Art, Science and Other Fields, A. Roth-

enberg, (R) 21:689

An Emerging Independent American Economy, 1815–1875, J. R. Frese and J. Judd, eds., (R) 23:122

"Emerging Pedagogical Approaches: The Technology Studies Program," D. E. Drake II, 19:478

"Emerging Themes in the History of Technology," T. P. Hughes, 20:697

Emerson, Roger L., (R) Chitnis, *The Scottish Enlightenment*, 19:524

Emme, Eugene M., "Introduction to the History of Rocket Technology," 4:337

Opening remarks by the editor of the *T&C* issue devoted to this subject.

———, "Aeronautics, Rocketry, and Astronautics," 9:436

Historical sessions were presented at the American Institute of Aeronautics and Astronautics meetings in Boston, December 1966, and Anaheim, October 1967; at the OAH meeting in Chicago, April 1967; and at the International Academy of Astronautics meeting in Belgrade, September 1967.

———, "Historical Considerations in Aviation Development: Transportation Engineering Conference, October 1968," 10:429

The Washington conference included a session with papers by I. B. Holley on the Joint Aircraft Committee of World War II, Douglas Robinson on fear and the flying public, Richard Smith on the demise of the rigid airship, and comments by Emme and Robin Higham.

———, "International History of Rocketry and Astronautics Symposium: Constance, West Germany, October 1970," 12:477

Report on the Fourth History Symposium of the International Academy of Astronautics, which presents chiefly memoirs and limits its historical papers to events more than twenty years past.

———, (R) Ropp, *War in the Modern World*, 2:275; (R) Bernardo, *Aviation in the Modern World*, 3:105; *Aeronautics and Astronautics*, (R) 3:210; (R) Thomas, *Men of Space*, 3:212; (R) Goddard, *Rocket Development*, 3:364; (R) Griffith, *The National Aeronautics and Space Act*, 4:231; (R) Odishaw, ed., *The Challenges of Space*, 5:265; (R) Quester, *Deterrence before Hiroshima*, 8:245; *A History of Space Flight*, (R) 8:248; (R) von Braun and Ordway, *History of Rocketry and Space Travel*, 9:250; (R) Goddard, ed., *The Papers of Robert H. Goddard*, 13:674; (R) Higham, *Air Power*, 15:345; (R) Stine, *The Third Industrial Revolution*, 17:809; (R) Cunningham, *The All-American Boys*, 19:782; (R) Higham and Kipp, eds., *Soviet Aviation and Air Power*, 20:828; (R) Ordway and Sharpe, *The Rocket Team*, 22:343

———, ed., "The History of Rocket Technology," 4:337

The editor's introduction, plus articles by Pendray (4:384), Dornberger (4:393), Hall (4:410), Hagen (4:435), Braun (4:452), Perry (4:466), Miles (4:478), Roach (4:490), Mayo-Wells (4:499), and Tokaty (4:515).

———, ed., *The Impact of Air Power*, (R) 2:75; *The History of Rocket Technology*, (R) 6:668; *Two Hundred Years of Flight in America*, (R) 19:575; *Twenty-five Years of the American Astronautical Society*, (R) 22:639; *Science Fiction and Space Futures*, (R) 25:690

Emmerson, George S., "L. T. C. Rolt and the *Great Eastern* Affair of Brunel versus Scott Russell," 21:553

In his biography of Isambard Kingdom Brunel, Rolt grossly maligns Brunel's partner, John Scott Russell; cf. Buchanan, 24:98.

———, "The *Great Eastern* Controversy: In Response to Dr. Buchanan," 24:107

Communication responding to Buchanan, 24:98.

———, (R) Pugsley, ed., *The Works of Isambard Kingdom Brunel*, 18:529; *John Scott Russell*, (R) 19:767; (R) Hayward, *The Story and Scandal of HMS "Magaera,"* 21:124; (R) Beckett, *Brunel's Britain*, 23:508; *The Greatest Iron Ship*, (R) 23:510; (R) Weiss, *The Making of Technological Man*, 24:498

Empire and Communications, H. A. Innis, (R) 14:482

Empires to Nations: Expansion in America, 1713–1824, M. Savelle, (R) 17:130

The Employed Inventor in the United States: R & D Policies, Law, and Practice, F. Neumeyer, (R) 12:673

Emulation and Invention, B. Hindle, (R) 25:660

"The Encyclopaedia Britannica Conference on the Technological Order," C. F. Stover, ed., vol. 3, no. 4 (entire issue)

Encyclopedia of North American Railroading: 150 Years of Railroading in the United States and Canada, F. Hubbard, (R) 24:692

Encyclopedia of U.S. Air Force Aircraft and

Missile Systems, Vol. 1, *Post World War II Fighters, 1945–1973*, M. S. Knaack, (R) 20:826

Encyclopedia of Urban Planning, A. Whittick, ed., (R) 16:315

L'Encyclopédie, ou dictionnaire raisonné des sciences, des arts et des métiers, D. Diderot, (R) 1:267

The End of an Era in Space Exploration: From International Rivalry to International Cooperation, B. C. D. Blaine, (R) 19:575

End of the Line: Alexander J. Cassatt and the Pennsylvania Railroad, P. T. Davis, (R) 20:228

"The End of the Marcus Legend," L. Bryant, 12:618.

Endrei, Walter, "The First Technical Exhibition," 9:181

Apparently organized by an inventor named Jean-Baptiste Picot, Chevalier d'Ormes, the 1683 Paris exhibition is described in a small brochure (54 pages, 12 plates), of which several copies exist.

———, *L'Evolution des techniques du filage et du tissage du Moyen-Age à la Révolution Industrielle*, (R) 12:92

Energy: Future Alternatives and Risks, National Academy of Sciences, (R) 17:177

Energy: Its Production, Conversion and Use in the Service of Man, P. Sporn, (R) 7:77

Energy and Economic Myths: Institutional and Analytical Economic Essays, N. Georgescu-Roegen, (R) 22:655

"Energy and Society [I]," 10:201

Notes on the first session, chaired by R. B. Lindsay, of a symposium at SHOT's 1968 Dallas meeting with papers by Lindsay on the history of energy concepts, Raymond Seeger on energy conservation theories, Edward Daub on energy concepts in the mid-nineteenth century, Erwin Hiebert on late nineteenth-century concepts, and Martin Klein on a twentieth-century challenge to conservation.

"Energy and Society [II], 10:205

Notes on the second session, chaired by Melvin Kranzberg, with papers by Eugene Ferguson on eighteenth-century energy uses, Harold Sharlin on nineteenth-century dynamical theory and technology, Lynwood Bryant on thermodynamics and engines, Richard Hewlett on nuclear power, and Bruce Netschert on future energy technology.

Energy and the Way We Live: A Course by Newspaper Reader, M. Kranzberg et al., eds., (R) 22:658

Energy and Transport: Historical Perspectives on Policy Issues, G. H. Daniels and M. H. Rose, eds., (R) 25:362

Energy Future: Report of the Energy Project at the Harvard Business School, R. Stobaugh and D. Yergin, eds., (R) 22:217

Energy in the American Economy, 1850–1975, S. H. Schurr and B. C. Netschert, (R) 2:285

Energy under the Oceans: A Technology Assessment of Outer Continental Shelf Oil and Gas Operations, D. E. Kash and I. L. White, (R) 16:122

Engerman, Stanley L.; *see* Fogel, Robert W.

Engewald, Gisela-Ruth; *see* Wächtler, Eberhard

The Engineer and Society, E. G. Semmler, ed., (R) 15:523

"The Engineer as an Agent in Technology Transfer," B. E. Benson, 16:67

The Engineer in the Industrial Corporation, R. R. Ritti, (R) 13:104

Engineering, R. J. Forbes, ed., in vol. 5 of *The Principal Works of Simon Stevin*, (R) 9:481

Engineering: Its Role and Function in Human Society, W. H. Davenport and D. Rosenthal, (R) 10:136

Engineering and Humanities, J. H. Shaub et al., eds., (R) 25:321

"Engineering and Science: A Historical Review and Appraisal," J. K. Finch, 2:318

Engineering and the Liberal Arts: A Technologist's Guide to History, Literature, Philosophy, Art, and Music, S. C. Florman, (R) 10:135

"Engineering and the Scientific Revolution," A. R. Hall, 2:333

Engineering as a Career, R. J. Smith, (R) 4:212

Engineering at Cambridge University, 1783–1965, T. J. N. Hilken, (R) 8:499

Engineering Classics of James Kip Finch, N. FitzSimons, ed., (R) 20:787

The Engineering Drawings of Benjamin Henry Latrobe, D. H. Stapleton, ed., (R) 22:794

Engineering Education at Penn State: A Century in the Land Grant Tradition, M. Bezilla, (R) 24:293

"Engineering Education for Social Leadership," W. E. Howland, 10:1

Engineering in American Society, 1850–1875, R. H. Merritt, (R) 12:120

Engineering in the Ancient World, J. G. Landels, (R) 19:728

The Engineering Industry of the North of Ireland, W. E. Coe, (R) 11:437

Engineering Professionalism and Ethics, J. H.

Schaub et al., eds., (R) 25:893
"Engineering the American Home," H. Wright, 24:481
"The Engineering Use of Human Beings," J. C. Wallace, 10:17
"Engineers against Time," 11:217
Notes on a session chaired by Oscar Anderson at SHOT's 1969 Washington meeting with papers by Constance Green on Project Vanguard and Francis Duncan on Lawrence's cyclotrons.
Engineers and Engineering in the Renaissance, W. B. Parsons, (R) 12:337
"Engineers and Political Economy in Twentieth-Century America," E. T. Layton, Jr., 23:466
"Engineers and the End of Innocence," S. C. Florman, 10:14
"Engineers and the New South Creed: The Formation and Early Development of Georgia Tech," J. E. Brittain and R. C. McMath, Jr., 18:175
"Engineers and the Progressive Era," 11:225
Notes on a session chaired by Samuel Hays at SHOT's 1969 Washington meeting with papers by Bruce Sinclair on the Cleveland Engineering Society, Carroll Pursell on engineers' concerns for natural resources, and comments by Samuel Haber and James Penick.
"Engineers Are People," J. B. Rae, 16:404
Engineers at the Golden Gate: A History of the San Francisco Army Corps of Engineers, 1866-1980, J. J. Hagwood, Jr., (R) 24:533
Engineers for the Public Good: A History of the Buffalo District, U.S. Army Corps of Engineers, N. M. Drescher, (R) 25:161
Engineers, Inventors and Workers, P. W. Kingsford, (R) 6:276
Engineers, Managers, and Politicians: The First Fifteen Years of Nationalised Electricity Supply in Britain, L. Hannah, (R) 25:153
Engineers of Independence: A Documentary History of the Army Engineers in the American Revolution, 1775–1783, P. K. Walker, ed., (R) 24:269
Engle, Anita, (R) Perrot, ed., *Journal of Glass Studies*, 21:481
———, ed., *Readings in Glass History*, no. 3, (R) 16:479; no. 5, (R) 17:412; no. 6/7, (R) 18:520; no. 8, (R) 19:548; *Ancient Glass in Its Context*, (R) 21:235
Engler, Robert, *The Politics of Oil*, (R) 3:365
English, Walter, *The Textile Industry*, (R) 11:636
English and American Steam Carriages and Traction Engines, W. Fletcher, (R) 16:304
The English Cotton Industry and the World Market, 1815–1896, D. A. Farnie, (R) 22:620
English Culture and the Decline of Industrial Spirit, 1850–1980, M. J. Wiener, (R) 24:130
The English Dairy Farmer, 1500–1900, G. E. Fussell, (R) 9:117
English Medieval Graffiti, V. Pritchard, (R) 10:607
Enos, John Lawrence, *Petroleum Progress and Profits*, (R) 4:82
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Enterprise Denied: Origins of the Decline of American Railroads, 1897–1917, A. Martin, (R) 14:89
Enterprise in Soap and Chemicals: Joseph Crosfield and Sons, Limited, 1815–1965, A. E. Musson, (R) 7:538
Entrepreneurs and Gentlemen: A Case History of a Japanese Company, A. Sueno, (R) 22:196
Entropy: A New World View, J. Rifkin, (R) 22:834
Die Entwicklung der Drehbank bis zum Jahre 1939, K. Wittmann, (R) 2:176
Die Entwicklung des Hochdruckdampfes in Deutschland, E.-O. Jochmann, (R) 2:178
Die Entwicklung des Stahlhochbaus, K. H. Wittek, (R) 6:279
Entwisle, Doris R.; *see* Huggins, W. H.
"The Envelopes That Bear the First Writing," D. Schmandt-Besserat, 21:357
Environment and Society in Transition: Scientific Developments, Social Consequences, Policy Implications, P. Albertson and M. Barnett, eds., (R) 14:345
The Environment of Change, A. W. Warner et al., eds., (R) 11:652
Environment, Technology, and Health: Human Ecology in Historical Perspective, M. Eisenbud, (R) 21:272
Environmental Engineering and Metropolitan Planning, J. A. Logan et al., eds., (R) 4:360
Environmental Politics and the Coal Coalition, R. H. K. Vietor, (R) 22:831
Environmental Quality and Social Responsibility, R. S. Khare et al., eds., (R) 15:529
Environmental Quality in a Growing Economy, H. Jarrett, ed., (R) 8:523
Environmental Radioactivity, M. Eisenbud, (R) 5:101

"Environmental Studies in Mid-19th-Century America," 9:340
Notes on a session chaired by John Greene at SHOT's 1967 Toronto meeting with papers by Nathan Reingold on Bache and the U.S. Coast Survey, Harold Burstyn on Farrel and the Nautical Almanac Office, and Thomas Manning on Powell and the U.S. Geological Survey.
Epstein, A. L., *Matupit*, (R) 12:151
The Era of the Joy Line: A Saga of Steamboating on Long Island Sound, E. L. Dunbaugh, (R) 25:880
Erasmus, Charles J., *Man Takes Control*, (R) 3:219
Erasmus, Charles J., Solomon Miller, and Louis C. Faron, *Contemporary Change in Traditional Communities of Mexico and Peru*, (R) 20:655
Erb, Guy F., and Valeriana Kallab, eds., *Beyond Dependency*, (R) 18:582
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Erickson, Charlotte, *Invisible Immigrants*, (R) 15:497
Ericsson, Henry, *Sixty Years a Builder*, (R) 16:500
Erlich, Alexander, *The Soviet Industrialization Debate*, (R) 5:461
Ermenc, J. J., (R) Clark, *The Development of the English Traction Engine*, 5:258
"Erratum," 21:159
See Lienhard, 20:515.
Espenschied, Lloyd, " 'Something Rotten in Denmark' . . . in Boston," 11:596
Communication concerning Brittain, 11:36.
Esper, Thomas, "The Replacement of the Longbow by Firearms in the English Army," 6:382
Military archery was abandoned in the sixteenth century because practiced archers were lacking, the result of a long decline in archery as a national sport; awarded 1966 Abbott Payson Usher Prize.
———, "Industrial Serfdom and Metallurgical Technology in 19th-Century Russia," 23:583
Obsolescent technology reflected less the use of serfs than the industry's remoteness in the Urals and the cost of fuel.
———, (R) Zagorskii, *Vladimir Sergeeivich Knabbe*, 7:93; (R) Webb, *Elizabethan Military Science*, 7:420; (R) Cipolla, *Guns, Sails, and Empires*, 8:220; (R) Voyce, *The Art and Architecture of Medieval Russia*, 9:133; (R) Hellie, *Enserfment and Military Change in Muscovy*, 13:310
An Essay on Church Clocks, with Reference to the Clock from the Hospital Santa Cruz, G. Berman, (R) 17:135
Essays from the Lowell Conference on Industrial History, 1980 and 1981, R. Weible et al., eds., (R) 24:687
Essays in Cornish Mining History, vol. 1, D. B. Barton, (R) 10:449
Essays in Public Works History, S. M. Hoy et al., eds., (R) 25:356
Essays in the History of Economics, G. J. Stigler, (R) 8:136
Essays of an Information Scientist, E. Garfield, (R) 23:524
Essays on a Mature Economy: Britain after 1840, D. N. McCloskey, ed., (R) 14:313
Essays on Creativity in the Sciences, M. A. Coler, ed., (R) 6:158
Essays on the History of Rockets and Astronautics: Proceedings of the Third through the Sixth History Symposia of the International Academy of Astronautics, R. C. Hall, ed., (R) 19:775
The Essential Tension: Selected Studies in Scientific Tradition and Change, T. S. Kuhn, (R) 20:218
Essers, I., *Max Valier*, (R) 19:251
The Eternal Present, S. Giedion, Vol. 1, *The Beginnings of Art*, (R) 5:120; Vol. 2, *The Beginnings of Architecture*, (R) 6:267
The Ethereal Aether: A History of the Michelson-Morley-Miller Aether-Drift Experiments, 1880–1930, L. S. Swenson, Jr., (R) 13:669
Ethics and Engineering Curricula, R. J. Baum, (R) 23:522
Ethics in an Age of Pervasive Technology, M. Kranzberg, ed., (R) 22:829
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———, "Technical Museums and International Exhibitions," 6:30
Most modern technical museums derive from nineteenth-century international exhibitions and unfortunately retain too much the air of permanent trade shows.

———, "Hall of Power Machinery, Museum of History and Technology," 9:75
Despite an outstanding display, the new exhibit nonetheless suggests hard questions about the purpose of museums.

———, "Cast-Iron Aqueduct in Rees's *Cyclopaedia*," 9:597
Its 39 volumes of text and 6 of plates edited by Abraham Rees (1743-1825) make *The Cyclopaedia; or, Universal Dictionary of the Arts, Sciences, and Literature* (1802–1819) a rich source for the history of technology.

———, "Leupold's *Theatrum machinarum*: A Need and an Opportunity," 12:64
On Jacob Leupold (1674–1727) and his multivolume technological compendium.

———, "Toward a Discipline of the History of Technology," 15:13
Belonging to the humanities rather than the sciences, history of technology should concentrate on social causes and consequences.

———, "Martha Teach Gnudi (1908–76)," 17:521
Memorial to a noted historian of medicine and translator of sixteenth-century Italian works in history of technology.

———, "Elegant Inventions: The Artistic Component of Technology," 19:450
Invention requires art as well as science.

———, "The American-ness of American Technology," 20:3
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———, "Toys and Turning," 20:691
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———, "New Ventures—Science, Industry, and War," 21:451
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———, "The Role of Purely Technical Innovation in the History of Engineering," 3:307

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On the philosophy and future of science museums.

———, "[Works-in-progress II,]" 19:489

Summary of a session at SHOT's 1977 Washington meeting with papers by Richard Hartenberg on mechanical motion, Mary Robischon on London instrument makers, Selma Thomas on Honore Blanc, Darwin Stapleton on Latrobe's engineering drawings, Leonard Reich on Langmuir, Rita Adrosko on Jacquard and calculating machines, Rachel Maines on needlework technology since 1850, and Donald Avery and P. Schmidt on African smelting.

———, "Museum Reviews and the History of Technology: The Milwaukee Public Museum," 23:458

Summary of a session at SHOT's 1981 Milwaukee meeting with accounts by Nancy Lurie of the muse-

um's urban exhibit, Howard Madaus of the firearms exhibit, and critiques by Stuart Leslie, Russell Fries, and Brooke Hindle.

———, "Shaping the Twentieth Century: Public Visions of Technological Futures," 23:462
Summary of a session at SHOT's 1981 Milwaukee meeting with papers by Carolyn Marvin on nineteenth-century predictions of electrical communication, Susan Douglas on the popularity of wireless, Allan Mazur on early twentieth-century future shock, and comments by Joseph Corn.

———, (R) Schroeder, *Contact at Sea*, 9:498; (R) Sydenham, *Measuring Instruments*, 24:722; *see also* Coates, Vary

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First Across: The U.S. Navy's Transatlantic Flight of 1919, R. K. Smith, (R) 16:502

The First Henry Ford: A Study in Personality and Business Leadership, A. Jardim, (R) 12:516

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"The First Microscope of Henry Clifton Sorby," R. H. Nuttall, 22:275

The First Nonstop Coast-to-Coast Flight and the Historic T-2 Airplane, L. S. Casey, (R) 6:666

"The First Reinforced-Concrete Skyscraper: The Ingalls Building in Cincinnati and Its Place in Structural History," C. W. Condit, 9:1

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Firth, Raymond, and B. S. Yamey, eds., *Capital, Saving and Credit in Peasant Societies*, (R) 6:293

Fisch, Gerald G., *Organization for Profit*, (R) 6:513

Fischer, Robert, and Amos St. Germain, "Interface '77—Humanities and Technology: Southern Technical Institute, Marietta, Georgia, October 20–22, 1977," 19:703
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Fischer, William B., (R) Mehrtens and Richter, eds., *Naturwissenschaft, Technik und NS-Ideologie*, 23:485

Fisher, Berenice M., *Industrial Education*, (R) 9:516

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Fishman, Robert, *Urban Utopias in the Twentieth Century*, (R) 20:815

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Fitchen, John F., III, "The Problem of Ventilation through the Ages," 22:485
Ventilation has always been a central factor in human building, and key problems have repeatedly reemerged.

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Fitzsimons, Mayvis, "Right On!" 17:526
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FitzSimons, Neal, "James Kip Finch (1883–1967)," 9:594
Memorial to a noted civil engineer and historian of engineering.

———, "Bridge-building Technology," 25:626
Summary of a session at SHOT's 1983 Washington meeting with papers by Eda Kranakis on Finley's patent chain-

suspension bridge, Richard Levy on Roebling's engineering designs, and Phyllis Rose on two twentieth-century Toronto bridges.

———, (R) Rennison, *Water to Tyneside,* 23:249

———, ed., *The Reminiscences of John B. Jervis,* (R) 12:649; *Engineering Classics of James Kip Finch,* (R) 20:787

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Five Hundred and Seven Mechanical Movements, H. T. Brown, (R) 24:719

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"Five Years of *Industrial Archaeology,*" T. W. Leavitt, 10:587

Flaherty, Bernard E., ed., *Psychophysiological Aspects of Space Flight,* (R) 2:433

Flajser, Steven H., (R) Kash and White, *Energy under the Oceans,* 16:122

"Flaws in McLuhan's Laws," W. H. Venable, 17:256

Fleckner, John, "Sources for the History of Recent Science and Technology," 25:627

Summary of a session at SHOT's 1983 Washington meeting with remarks by Robert Friedel on documents and archives, David De Vorkin on artifacts, and George Wise on oral history.

Fleming, Donald, and Bernard Bailyn, eds., *Perspectives in American History,* (R) 18:532

Fleming, Stuart, (R) Freer Gallery of Art, *Ars Orientalis,* 25:325

Fleron, Frederic J., Jr., "Technology and Communist Culture: Bellagio, Italy, August 22–28, 1975," 18:659

Convened under auspices of the Carnegie-funded ACLS Planning Group on Comparative Communist Studies, the conference centered on the cultural implications of technology transferred from West to East; cf. Feenberg, 20:348.

———, ed., *Technology and Communist Culture,* (R) 20:252

Flesh of Steel: Literature and the Machine in American Culture, T. R. West, (R) 10:111

Fletcher, Max E., (R) Kindleberger, *Economic Growth in France and Britain,* 6:285

Fletcher, William, *English and American Steam Carriages and Traction Engines,* (R) 16:304

Flick, Carlos, "The Movement for Smoke Abatement in 19th-Century Britain," 21:29

New laws and new technology failed to overcome economic and social obstacles to pollution control.

"The Flight Forum: A Summary," E. Benoit, 5:59

The Flight from Work, G. Palm, (R) 20:668

Flink, James J., *America Adopts the Automobile,* (R) 12:661; (R) *Automobile Quarterly* Editors, *The American Car since 1775,* 13:325; *The Car Culture,* (R) 17:400

Flinn, M. W., *Men of Iron,* (R) 5:257

———, ed., *Report on the Sanitary Conditions of the Labouring Population of Great Britain,* (R) 8:225

Florence, P. Sargant, *Post-war Investment, Location and Size of Plant,* (R) 5:110

Flores, Carlos; *see* Collins, George R.

Florida's Prehistoric Stone Technology, B. A. Purdy, (R) 24:509

Florman, Samuel C., "Engineers and the End of Innocence," 10:14

Engineers should be corrupted by the liberal arts; cf. Howland, 11:237.

———, "Reply," 11:240

Communication responding to Howland, 11:237.

———, *Engineering and the Liberal Arts,* (R) 10:135; (R) Basile, *Cultural Development of Managers, Executives, and Professionals,* 10:136; (R) Davenport and Rosenthal, eds., *Engineering,* 10:136; (R) Davenport, *The One Culture,* 13:343; *The Existential Pleasures of Engineering,* (R) 17:528; *Blaming Technology,* (R) 23:491; (R) Ramo, *What's Wrong with Our Technological Society,* 25:319

Flynn, John V., (R) Irving, *The Virus House,* 9:243

"Focus on Lighthouses," L. Blanchard, 19:804

Fogel, Robert William, *The Union Pacific Railroad,* (R) 2:405; *Railroads and American Economic Growth,* (R) 8:228

Fogel, Robert William, and Stanley L. Engerman, *Time on the Cross,* (R) 17:271

Fokker, A. D., ed., *Music,* in vol. 5 of *The Principal Works of Simon Stevin,* (R) 9:481

Foley, Vernard, (R) Brown, *Firearms in Colonial America,* 23:118

Foley, Vernard, with Steven Rowley, David F. Cassidy, and F. Charles Logan, "Leonardo, The Wheel Lock, and the Milling Process," 24:399

Renaissance lock-making techniques, to which Leonardo and Giulio Tedesco may have significantly contributed, foreshadowed industrial machining

processes and suggest a larger role for firearms than clocks in stimlating the development of precision methods.

Folsom, Michael Brewster, "[Works-in-progress I,] 20:607
Summary of a session at SHOT's 1978 Pittsburgh meeting with papers by Caroline Sloat on "factory girls" at Pomfret Manufacturing Company, Theodore Penn on Zachariah Allen and high-speed power transmission, Michael Massouh on nineteenth-century technology in Oneida County, Richard O'Connor on American interconnected electrical power systems, William Pickett on Capehart jukeboxes, and Robert Seidel and Arthur Norberg on the klystron.

———, (R) Hirsch, *Roots of the American Working Class*, 21:259; (R) Siracusa, *A Mechanical People*, 21:516

Folsom, Michael Brewster, and Steven D. Lubar, eds., *The Philosophy of Manufactures*, (R) 24:680

Foner, Philip S., *The Factory Girls*, (R) 19:752

La Font de la Vall de Segó, J. M. Cueco Adrián, (R) 7:522

The Fontana Economic History of Europe, C. M. Cipolla, ed., Vol. 3, *The Industrial Revolution*, and Vol. 4, *The Emergence of Industrial Societies*, (R) 15:485

Food: America's Biggest Business, P. Arnold and P. White, (R) 1:194

Food and Civilization: A Symposium, S. M. Farber et al., eds., (R) 9:627

The Food Crisis in Prehistory: Overpopulation and the Origin of Agriculture, M. N. Cohen, (R) 19:207

"Food in the Making of America," G. T. Sharrer, 20:595

Food Science and Technology, M. Pyke, (R) 6:665

"Food Technology," W. D. Rasmussen, 1:376

Forbes, Eric G., *The Birth of Scientific Navigation*, (R) 16:86

Forbes, R. J., (R) Gillispie, ed., *A Diderot Pictorial Encyclopedia of Trades and Industry*, 1:267; (R) Finch, *The Story of Engineering*, 2:33; *Studies in Early Petroleum History* and *More Studies in Early Petroleum History*, (R) 2:55; (R) *Der Ingenieur und seine Aufgaben in neuen Wirtschaftsraumen*, 2:82; (R) Poirier, *The Fifteen Wonders of the World*, 2:269; (R) Woodbury, *History of the Lathe to 1850*, 3:312; (R) Klemm, *Kurze Geschichte der Technik*, 4:52; (R) Daumas, ed., *Histoire générale des techniques*, 4:336; (R) de Camp, *The Ancient Engineers*, 5:69; (R) Drachmann, *The Mechanical Technology of Greek and Roman Antiquity*, 5:69; (R) *Dictionnaire archéologique des techniques*, vol. 1, 5:69; (R) Tylecote, *Metallurgy in Archaeology*, 5:254; *Bibliographia Antiqua*, (R) 5:639; (R) *Dictionnaire archéologique des techniques*, vol. 2, 6:267; (R) Oppenheim, *Ancient Mesopotamia*, 6:449; (R) Körting, *Geschichte der deutschen Gasindustrie*, 7:82; *The Conquest of Nature*, (R) 10:304

———, ed., *Engineering*, in vol. 5 of *The Principal Works of Simon Stevin*, (R) 9:481

The Force of Knowledge: The Scientific Dimension of Society, J. Ziman, (R) 18:264

Ford, Henry, II, *The Human Environment and Business*, (R) 12:386

Ford, J. Glyn, (R) Mackie, *Science and Society in Prehistoric Britain*, 20:356

Ford, Oliver; *see* Weible, Robert

Ford Foundation Energy Policy Project, *A Time to Choose*, (R) 17:177

Ford: Decline and Rebirth, 1933–1962, F. E. Hill and A. Nevins, (R) 5:616

Foreign Direct Investment, Industrialization, and Social Change, S. J. Korbin, (R) 20:662

Fores, Michael, "Price, Technology, and the Paper Model," 12:621
Price (6:621) misrepresents technology in seeking to distinguish science from technology by their use of paper.

———, "The History of Technology: An Alternative View," 20:853
Communication insisting on technology as art rather than science.

"Foreword," W. Benton, 3:381

Form, William H., *Blue Collar Stratification*, (R) 18:124

Form Follows Fiasco: Why Modern Architecture Hasn't Worked, P. Blake, (R) 20:394

Forman, Paul, (R) Pais, *Subtle Is the Lord*, 25:697

The Formation of the American Scientific Community: The American Association for the Advancement of Science, 1848–1860, S. G. Kohlstedt, (R) 17:758

Forney, Matthias N., *The Car Builder's Dictionary*, (R) 13:636

Forrestal, Dan J., *Faith, Hope, and $5,000*, (R) 20:236

Forrester, Jay W., *Urban Dynamics*, (R) 11:109

Forsyth, David P., *The Business Press in America*, (R) 6:538

Forti, Umberto, *Storia della tecnica dal Medioevo al Rinascimento*, (R) 1:419

The Fortifications and Defense of Constantinople, B. Tsangadas, (R) 23:477

"Fortifications and Military Tactics: Fulk Nerra's Strongholds circa 1000," B. S. Bachrach, 20:531

The Fortified Cities of India, S. Toy, (R) 9:139

Foster, John, *Class Struggle and the Industrial Revolution,* (R) 17:375

Foster, Mark S., (R) Rose, *Interstate,* 21:522; (R) Carlson and Schneider, *PCC,* 23:506

Foundations of Engineering, P. Sporn, (R) 6:263

Foundations of Gandhian Economics, A. Das, (R) 22:688

Foundations of the Stereoscopic Cinema: A Study in Depth, L. Lipton, (R) 25:689

Fountain, Alvin M., (R) Jones, *Weights and Measures,* 5:276

Fourastié, Jean, *The Causes of Wealth,* (R) 2:262

"The Fourth Discontinuity," B. Mazlish, 8:1

Fowler, George L., *Locomotive Dictionary,* (R) 14:304

Fowles, Jib, (R) O'Neill, *The High Frontier,* 18:718; (R) Cornish, *The Study of the Future,* 19:592; (R) Brand, *Space Colonies,* 20:240; (R) Comstock et al., *Television and Human Behavior,* 21:142; (R) Godet, *The Crises in Forecasting and the Emergence of the "Prospective" Approach,* 21:699; (R) Nevitt, *ABC of Prophecy,* 23:96

Fox, Robert, "The Fire Piston and Its Origins in Europe," 10:355

Interest in thermal effects of gas compression led Joseph Mollet to invent the fire piston (1804), which was widely used in Southeast Asia before 1865, the idea perhaps having been transmitted from Europe.

Fox, Robert, and George Weisz, eds., *The Organization of Science and Technology in France,* (R) 23:235

Fox Talbot and the Invention of Photography, G. Buckland, (R) 25:115

Fram, Mark, *Ontario Hydro,* (R) 23:661

Frame, Robert M., III, "Society for Industrial Archeology: Twelfth Annual Conference, Minneapolis—St. Paul, May 12–15, 1983," 25:639

The program included sessions on a broad range of topics in industrial archaeology, stressing those of local interest, as well as several field trips and a teaching workshop.

France and the Economic Development of Europe, 1800–1914, R. E. Cameron, (R) 2:403

"Francesco di Giorgio Martini's Treatise on Engineering and Its Plagiarists," L. Reti, 4:287

Francillon, René J., *McDonnell Douglas Aircraft since 1920,* (R) 23:133

Francis, Devon, *Mr. Piper and His Cubs,* (R) 16:665

Francis Place and the Early History of the Greenwich Obervatory, D. Howse, (R) 17:414

"François van Rysselberghe: Pioneer of Long-Distance Telephony," D. G. Tucker, 19:650

Frank Lloyd Wright's Fallingwater: The House and Its History, D. Hoffmann, (R) 20:645

Franke, Herbert W., *Computer Graphics/Computer Art,* (R) 13:660

Frankel, Francine R., *India's Green Revolution,* (R) 13:330

Frankel, J. P., "The Origin of Indonesian *Pamor,*" 4:14

A technique of diffusion welding to produce patterned steel weapon blades began to develop locally in the fourteenth century.

Franklin, Alan D., Jacqueline S. Olin, and Theodore A. Wertime, eds., *The Search for Ancient Tin,* (R) 21:474

Franklin, H. Bruce, ed., *Future Perfect,* (R) 8:151

Frantz, Joe B., (R) Martin, *The City Moves West,* 12:128; (R) Bryant, *Arthur E. Stilwell,* 14:88; (R) Green, *Land of the Underground Rain,* 15:339; (R) Baker et al., *Water for the Southwest,* 15:501; (R) Kohlmeyer, *Timber Roots,* 17:158

Die französische Pendule des 18. Jahrhunderts: Ein Beitrag zu ihrer Ikonologie, K. Maurice, (R) 10:99

Fraser, Colin, *Henry Ferguson: Inventor and Pioneer,* (R) 14:511

Fraunberger, Fritz, *Elektrische Spielereien im Barock und Rokoko,* (R) 10:100

Frazier, Arthur H., "Daniel Farrand Henry's Cup Type 'Telegraphic' River Current Meter," 5:541

In 1867–68 Henry (1822–1907), a member of the U.S. Lake Survey, devised a controversial but successful instrument to measure water velocity in natural streams.

———, *Water Current Meters in the Smithsonian Collections,* (R) 17:415

Frederick, Duke, William L. Howenstine, and June Socherr, eds., *Destroy to Create,* (R) 15:106

Frederick Taylor: A Study in Personality and Innovation, S. Kakar, (R) 12:666

Frederick W. Taylor and the Rise of Scientific Management, D. Nelson, (R) 23:266

Free Men and Free Markets, R. Theobald, (R) 5:481
Freeman, C., (R) Nordhaus, *Invention, Growth, and Welfare*, 12:375
Freeman, C., and A. Young, *The Research and Development Effort in Western Europe, North America and the Soviet Union*, (R) 8:251
Freeman, E. J.; *see* Watt, J.
Freer Gallery of Art, *Ars Orientalis*, (R) 25:325
Freilich, Morris, (R) Applebaum, *Royal Blue*, 23:500
Frejka, Tomas, (R) Knodel, *The Decline of Fertility in Germany*, 17:389
"The French Connection: Giffard's Injector and the Nature of Heat," E. F. Kranakis, 22:3
"The French Crash Program for Saltpeter Production, 1776-94," R. P. Multhauf, 12:163
French Popular Lithographic Imagery, 1815–1870, Vol. 1, *Lithographs and Literature*, B. Farwell, (R) 25:113
Frese, Joseph R., and Jacob Judd, eds., *Business Enterprise in Early New York*, (R) 22:189; *An Emerging Independent American Economy*, (R) 23:122; *American Industrialization, Economic Expansion, and the Law*, (R) 24:689
Freudenberger, Herman, "On the *Genesis of Modern Management*," 10:593
Summary of a session at SHOT's 1980 Toronto meeting with papers by John Larson on railroads, Richard Wines on recycling and fertilizers, Theodore Penn on power transmission, and comments by Hunter Dupree.
———, *The Waldstein Woolen Mill*, (R) 5:449; (R) Jordan, *Die kaiserliche Wirtschaftspolitik im Banat im 18. Jahrhundert*, 10:314; (R) Endrei, *L'Evolution des techniques du filage et du tissage du Moyen-Age à la Révolution Industrielle*, 12:92; (R) Rossman, *Schuss und Kette*, 14:312; (R) Gold, *Explorations in Managerial Economics*, 15:351
Freudenheim, Leslie Mardelson, and Elizabeth Sussman, *Building with Nature*, (R) 18:122
Frey, Howard C.; *see* Shumway, George
Freyer, Tony, (R) Uselding, ed., *Research in Economic History*, 21:102
Frick, George F., (R) Carter and Polites, eds., *The Virginia Journals of Benjamin Henry Latrobe*, 20:226; (R) Sellers, *Mr. Peale's Museum*, 22:317
Fridenson, Patrick; *see* Bardou, Jean-Pierre
Fried, Ava K.; *see* Morgan, Robert P.
Fried, Jacob, and Paul Molnar, *Technological and Social Change*, (R) 21:540
Friedel, Robert D., "Systems and the History of Technology," 22:570
Summary of a session at SHOT's 1980 Toronto meeting with papers by John Larson on railroads, Richard Wines on recycling and fertilizers, Theodore Penn on power transmission, and comments by Hunter Dupree.
———, (R) Smithsonian Archives, comp., *Guide to the Smithsonian Archives*, 21:509; (R) Szary, comp., *Guide to Manuscript Collections in the National Museum of History and Technology*, 21:509; (R) Elliott, *Biographical Dictionary of American Science*, 21:512; (R) *Electronics* Editors, *An Age of Innovation*, 23:128; *Pioneer Plastic*, (R) 25:674
Friedland, William H., Amy E. Barton, and Robert J. Thomas, *Manufacturing Green Gold*, (R) 21:113
Friedman, Alan J., "The Clockwork Universe," 25:280
Review of a National Museum of History and Technology exhibit centered on the cultural context of clocks and automata, 1550–1650.
Friedman, J., and M. J. Rowlands, eds., *Evolution of Social Systems*, (R) 20:620
"Friedrich Klemm (1904–1983)," O. Mayr, 25:377
Fries, Russell I., "British Response to the American System: The Case of the Small-Arms Industry after 1850," 16:377
Noneconomic as well as economic factors account for differences in rates of adoption among military and sporting arms industries; awarded 1976 Abbott Payson Usher Prize.
———, (R) Lundeberg, *Samuel Colt's Submarine Battery*, 17:148; (R) Vanderbilt, *Inventing*, 18:105; (R) Fram, *Ontario Hydro*, 23:661; (R) Goodman et al., eds., *Small Hydroelectric Projects for Rural Development*, 24:526; (R) Sahal, *Patterns of Technological Innovation*, 25:317
Fries, Sylvia Doughty, "Technological Change and Work: Three Eras," 21:460
Summary of a session at SHOT's 1979 Newark meeting with papers by Daryl Hafter on craftswomen in preindustrial Europe, Judith McGaw on machines and women's work in nineteenth-century America, and comments by Warren Van Tine.
———, (R) King, *Colonial Urban Development*, 19:217; *The Urban Idea in Colonial America*, (R) 19:748; (R) Goist, *From Main Street to State Street*, 19:750; (R) Horwitz, *Anthropology toward History*, 20:367; (R) Hechler, *Toward the Endless Frontier*, 22:209; (R) Olson, *Baltimore*, 22:628
Frisinger, H. Howard, *The History of Meteorology to 1800*, (R) 19:522

From a Scientific Heritage, F. A. Tsander, (R) 11:318

From Art to Science: Seventy-two Objects Illustrating the Nature of Discovery, C. S. Smith, (R) 23:470

From Engines to Autos: Five Pioneers in Engine Development and Their Contributions to the Automotive Industry, E. Diesel et al., (R) 2:189

From ENIAC to UNIVAC: An Appraisal of the Eckert-Mauchly Computers, N. Stern, (R) 24:148

From Field to Factory, M. Klass, (R) 20:839

From Geography to Geotechnics, B. MacKaye, (R) 10:622

From Horsecars to Streamliners: An Illustrated History of the St. Louis Car Company, A. R. Lind, (R) 21:118

From Know-How to Nowhere: The Development of American Technology, E. E. Morison, (R) 17:746

From Main Street to State Street, P. D. Goist, (R) 19:750

From Miasmas to Molecules, W. B. Wood, Jr., (R) 4:368

"From Military to Civilian Technology: The Introduction of Tear Gas for Civil Riot Control," D. P. Jones, 19:151

From Prairie to Corn Belt: Farming on the Illinois and Iowa Prairies in the Nineteenth Century, A. G. Bogue, (R) 5:454

From Stone to Steel: Economic Consequences of a Technological Change in New Guinea, R. F. Salisbury, (R) 5:272

From the Hand of Man: Primitive and Preindustrial Technologies, R. F. G. Spier, (R) 13:66

"From Virginia Dare to Virginia Slims: Women and Technology in American Life," R. S. Cowan, 20:51

From Watt to Clausius: The Rise of Thermodynamics in the Early Industrial Age, D. S. L. Cardwell, (R) 13:315

Frontier Iron: The Maramec Iron Works, 1826–1876, J. D. Norris, (R) 6:653

Frontiers of Change: Early Industrialization in America, T. C. Cochran, (R) 24:270

Froomkin, Joseph N., (R) Tybout, ed., *Economics of Research and Development*, 7:564

Frozen Tombs of Siberia: The Pazyryk Burials of Iron-Age Horsemen, S. I. Rudenko, (R) 12:332

Fruchtbaum, Harold, "Questionable Opinions," 16:615

Communication concerning Eysenck review, 15:666; cf. Dorn, 17:523.

Fry, Robin, *The VW Beetle*, (R) 25:365

Fryer, David M., and John C. Marshall, "The Motives of Jacques de Vaucanson," 20:257

Toymakers only in part, eighteenth-century devisers of automata also sought to model a mechanistic universe.

Fryling, Glenn R., untitled communication, 2:93

Critical remarks on Gilfillan, 1:201; cf. Gilfillan, 2:95.

———, (R) Jochmann, *Die Entwicklung des Hochdruckdampfes in Deutschland*, 2:178

———, ed., *Combustion Engineering*, (R) 8:506

Fuchs, Victor R., and Jean Alexander Wilburn, *Productivity Differences within the Service Sector*, (R) 9:262

"Fueling the Third Reich," A. Krammer, 19:394

Fuhrmann, Joseph T., *The Origins of Capitalism in Russia*, (R) 14:315

Fukushima, Y., (R) Havens, *Farm and Nation in Modern Japan*, 16:504; (R) Pauer, *Technik-Wirtschaft-Gesellschaft*, 16:628; (R) Nakayama et al., eds., *Science and Society in Modern Japan*, 18:574

Fuller, R. Buckminster, *Comprehensive Thinking*, (R) 7:262

Fuller, R. Buckminster, with E. J. Applewhite, *Synergetics*, (R) 17:104

Fuller, R. Buckminster, and John McHale, *Inventory of World Resources, Human Trends, and Needs* and *The Design Initiative*, (R) 6:504

Fuller, R. Buckminster, Eric A. Walker, and James R. Killian, *Approaching the Benign Environment*, (R) 12:140

Fuller, Wayne E., *The American Mail*, (R) 14:628

Fullmer, June Z., [Works-in-progress II,] 20:609

Summary of a session at SHOT's 1978 Pittsburgh meeting with papers by M. C. Usselman on platinum processing and marketing, Leslie Blanchard on lighthouse engineers, Edward Pershey on von Baader's railroad designs, Donald Thomas on the diesel engine, Lillian Hoddeson on the Fermilab synchrotron, and Rudi Volti on energy politics in China.

———, "Technology, Chemistry, and the Law in Early 19th-Century England," 21:1

Testimony of chemists in an 1820 trial revealed much about the state of chemistry, the status of chemists, and the social relations of science.

———, (R) Young, *A Short History of Ale*, 22:193

Fulton, Garland, "The General Climate

for Technological Developments in Naval Aeronautics on the Eve of World War I" 4:154
A U.S. Navy captain on aeronautical engineering duties from 1918 to 1940 reminisces about his early experiences.
The Functional Tradition in Early Industrial Building, J. M. Richards, (R) 1:278
Fundamenta Scientiae, B. Jurdant and M. Paty, eds., (R) 23:98
Fundamental Measures and Constants for Science and Technology, F. D. Rossini, (R) 17:122
Fundamental Research and the Policies of Government, OECD, (R) 8:126
Furniss, Cliff, *Servants of the North*, (R) 20:804
Furtado, Celso, *Development and Underdevelopment*, (R) 6:510
Furter, William F., ed., *A History of Chemical Engineering*, (R) 24:716; *A Century of Chemical Engineering*, (R) 25:370
Fusfeld, Herbert I., and Carmela S. Haklisch, eds., *Science and Technology Policy*, (R) 23:692
Fusion: Science, Politics, and the Invention of a New Energy Source, J. L. Bromberg, (R) 25:154
Fussell, G. E., "Farming Systems of the Classical Era," 8:16
Greek and Roman farming practices formed the base from which modern techniques evolved.
———, (R) Boserup, *The Conditions of Agricultural Growth*, 7:415; (R) Hallam, *Settlement and Society*, 7:418; (R) Chibnall, *Sherington*, 7:524; (R) Postan, ed., *Cambridge Economic History of Europe*, 8:403; (R) *The Agrarian History of England and Wales*, vol. 4, Thirsk, ed., 8:492; *The English Dairy Farmer*, (R) 9:117; (R) White, *Agricultural Implements of the Roman World*, 9:602; (R) Collins, *Sickle to Combine*, 12:350; (R) *Mary Wedlake's Priced List of Modern Farm Implements*, 12:350; (R) White, *A Bibliography of Roman Agriculture*, 13:113; (R) *The Agrarian History of England and Wales*, vol. 1, pt. 2, Finberg, ed., 14:491; *The Classical Tradition in West European Farming*, (R) 14:493; *Crop Nutrition*, (R) 15:98; *Jethro Tull*, (R) 15:98; (R) Gazley, *The Life of Arthur Young*, 15:487; (R) Perry, *British Farming in the Great Depression*, 15:645; (R) Huggett, *The Land Question and European Society*, 17:370; (R) White, *Farm Equipment of the Roman World*, 17:541
The Future as Nightmare: H. G. Wells and the Anti-utopians, M. R. Hillegas, (R) 9:523
"Future Exploration and Utilization of Outer Space," H. L. Dryden, 2:112
The Future of Technological Civilization, V. C. Ferkiss, (R) 16:696
The Future of the Future, J. McHale, (R) 11:473
The Future of the Research Library, V. W. Clapp, (R) 6:161
Future Perfect, H. B. Franklin, ed., (R) 8:151
Future Shock, A. Toffler, (R) 12:532
Fysh, Hudson, *Qantas Rising*, (R) 7:560; *Qantas at War*, (R) 10:119

Gablehouse, Charles, *Helicopters and Autogiros*, (R) 9:249
Gabor, Dennis, (R) Balázs, *A tudományos kutatástól az ipari gyártásig*, 7:534; *Innovations*, (R) 13:107; *The Mature Society*, (R) 15:352
Gabriel Kron and Systems Theory, H. H. Happ, ed., (R) 16:117
Gade, Daniel W., "Grist Milling with the Horizontal Waterwheel in the Central Andes," 12:43
Introduced after the conquest, horizontal wheels remain widely used.
Gadol, Joan, *Leon Battista Alberti*, (R) 12:632
Gaines, David I., (R) Chadwick, *Report on the Sanitary Conditions of the Labouring Population of Great Britain*, 8:225; (R) Brand, *Doctors and the State*, 8:225; (R) Tarn, *Five Per Cent Philanthropy*, 16:496
Gale, W. K. V., *Iron and Steel*, (R) 11:630; (R) Raybould, *The Economic Emergence of the Black Country*, 16:484; *Iron and Steel*, (R) 20:800
Gale, W. K. V., and C. R. Nicholls, *The Lilleshall Company Limited*, (R) 22:807
Galeona Zygmunta Augusta: Próba rekonstruckcji [Sigismund Augustus's galleon: A probable reconstruction], M. Boczar, (R) 17:790
Gallagher, Edward J., *A Thousand Thoughts on Technology and Human Values*, (R) 21:700
Gallie, Duncan, *In Search of the New Working Class*, (R) 22:358
Gamst, Frederick C., *The Hoghead*, (R) 24:522
Ganzevoort, Herman, trans. and ed., *A Dutch Homesteader on the Prairies*, (R) 15:499
Garbage in the Cities: Refuse, Reform, and the Environment, 1880-1980, M. V. Melosi, (R) 24:541
Garber, Paul Edward, (R) Means, *James Means and the Problem of Manflight*, 8:115
García Ballester, Luis; *see* López Piñero, José M.

Garcia-Diego, José A., "Restoration of Technological Monuments in Spain," 13:426
Juanelo Turriano's Toledo waterworks were partly reconstructed in conjunction with a modern irrigation project.
———, "The Chapter on Weirs in the Codex of Juanelo Turriano: A Question of Authorship," 17:217
Book nine of the codex attributed (perhaps erroneously) to Juanelo describes sixteenth-century dam-building.
———, (R) Glick, *The Old World Background of the Irrigation System of San Antonio,* 14:622; (R) Fernández Ordóñez, *Eugène Freyssinet,* 22:788
Gardet, L., A. J. Gurevich, A. Kagame, C. Larre, G. E. R. Lloyd, A. Neher, R. Panikkar, G. Pattaro, and P. Ricoeur, *Cultures and Time,* (R) 21:87
Gardner, Paul V., *The Glass of Frederick Carder,* (R) 13:656
Garfield, Eugene, *Citation Indexing,* (R) 21:714; *Essays of an Information Scientist,* (R) 23:524
Garland, Martha MacMackin, *Cambridge before Darwin,* (R) 24:127
Garretts of Leiston, R. A. Whitehead, (R) 7:88
Garside, Patricia, (R) Kanter, *Work and Family in the United States,* 19:129
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———, "Institutional Responses to Technological Change: Three Case Studies from the U.S. Navy," 19:485

Summary of a session at SHOT's 1977 Washington meeting with papers by Richard Glasow on the Newport Torpedo Station, Philip Rosen on electronic communications during the Progressive Era, Lawrence Korb on naval bureaucrats and nuclear power, and comments by Harold Langley.

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Haines, Charles, "The Making of Victorian America: Henry Ford Museum's 'Mass-Produced Elegance,' " 25:832
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Haines, Michael R., (R) Lindstrom, *Economic Development in the Philadelphia Region,* 20:642

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Hall, A. Rupert, "*A History of Technology*: Some Editorial Reflections," 1:311
One of Singer's coeditors discusses the problems of the five-volume undertaking.

———, "More on Medieval Pivoted Axles," 2:17
The unpublished 1335 manuscript of Guido da Vigevano not only shows they existed but suggests pivoted front axles were common.

———, "Engineering and the Scientific Revolution," 2:333
Science had little to give engineering before the nineteenth century, nor engineering much to give science.

———, "The Changing Technical Act," 3:501
Western technology evolved toward mass production rather than art, eventually making possible applied science and breaking the exclusively empirical mold that elsewhere limited technical achievement.

———, (R) Clagett, *The Science of Mechanics in the Middle Ages,* 1:259; (R) Middleton, *The History of the Barometer,* 6:130; (R) *The Principal Works of Simon Stevin,* vol. 4, 7:72; (R) vol. 5, 9:481; (R) Hessen, *The Social and Economic Roots of Newton's "Principia,"* 13:629; (R) Plum, *Natural Science and Technology on the Road to the "Industrial Revolution,"* 17:127; *see also* Singer, Charles

Hall, A. Rupert, and Norman Smith, eds., *History of Technology,* vol. 1, (R) 18:738; vol. 2, (R) 21:633; vol. 5, (R) 23:234

Hall, Bert S., "A Revolving Bookcase by Agostino Ramelli," 11:389
Ramelli's design from *De diverse et artificiose machine* (1588) used epicyclic gearing, subsequently much misunderstood.

———, "Medieval and Pre-modern Technology," 25:617
Summary of a session at SHOT's 1983 Washington meeting with papers by Marjorie Boyer on a fourteenth-century French pile driver, Mary Robischon on medieval and early modern instrument makers, and Hall on late medieval European cast iron.

———, (R) Stöcklein, *Leitbilder der Technik,* 12:495; (R) Schwob, *Kulturelle Bezeihungen zwischen Nürnberg and den Deutschen in Südosten im 14. bis 16. Jahrhundert,* 13:309; (R) Dressler and Zimmermann, eds., *Scriptorum Opus,* 13:494; Wehmer, *Deutsche Buchdrucker des fünfzehnten Jahrhunderts,* 13:627; *The Technological Illustrations of the So-called "Anonymous of the Hussite Wars,"* (R) 25:109

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Hall, Marie Boas; *see* Woodcroft, Bennet

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From 1945 to 1949, U.S. armed forces began several advanced rocket and satellite programs but none won official support.

———, "Fifth International Symposium on the History of Rocketry and Astronautics: Brussels, September 1971," 15:70
Sponsored by the International Academy of Astronautics, the symposium included papers on early rocketry and memoirs by scientists and engineers active before 1951.

———, *Lunar Impact,* (R) 19:777

———, ed., *Essays on the History of Rocketry and Astronautics,* (R) 19:775

Hall, R. Cargill, and James J. Sloane, "Fifty Years of Air Transport History: AIAA Meeting, Anaheim, California, October 1969," 11:401
An all-day session on air transport history included papers on the invention of the airliner, origins of commercial airlines, adaptation of military engines to civilian needs, transatlantic flight, Chinese airlines, airlines' choices of aircraft, and the SST.

Hall, Robert de Zouche, ed., *A Bibliography on Vernacular Architecture,* (R) 15:671

Hall, Timothy H.; *see* Kranzberg, Melvin

"Hall of Power Machinery, Museum of History and Technology," E. S. Ferguson, 9:75

Hallam, H. E., *Settlement and Society,* (R) 7:418

Halle, Gerhard, *Otto Lilienthal,* (R) 4:94

Halleux, Robert, *Le Problème des métaux dans la science antique*, (R) 17:535

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Higham, Robin, and Donald J. Mrozek, eds., *Supplement 1* to *A Guide to the Sources of United States Military History*, (R) 24:709

Highrise Building and Urban Design, H. Aregger and O. Glaus, (R) 9:502

Highways over Broad Waters: Life and Times of David B. Steinman, Bridgebuilder, W. Ratigan, (R) 2:204

Hildebrand, Grant, *Designing for Industry*, (R) 16:313

Hilgartner, Stephen, Richard C. Bell, and Rory O'Connor, *Nukespeak*, (R) 25:889

Hilken, T. J. N., *Engineering at Cambridge University*, (R) 8:499

Hill, C. R., *Chemical Apparatus*, (R) 15:365

Hill, Derek, and Oleg Grabar, *Islamic Architecture and Its Decoration*, (R) 7:228

Hill, Donald R., (R) Schiøler, *Roman and Islamic Water-lifting Wheels*, 15:628; *Arabic Water-Clocks*, (R) 25:326

———, trans., *The Book of Knowledge of Ingenious Mechanical Devices by Ibn al-Jazari*, (R) 16:81; *The Book of Ingenious Devices by Banū Musà bin Shākir*, (R) 21:231

Hill, Frank E., and Allan Nevins, *Ford*, (R) 5:616

Hill, Lewis E., (R) Rowe, *An Anatomy of Risk*, 19:788; (R) Cunningham et al., *Technological Innovation*, 19:788

Hillegas, Mark R., *The Future as Nightmare*, (R) 9:523

Hilliard, Sam B., "The Dynamics of Power: Recent Trends in Mechanization on the American Farm," 13:1

U.S. farmers have multiplied their use of tractors and self-propelled machinery since World War II.

Hills, Richard L., *Machines, Mills and Uncountable Costly Necessities*, (R) 10:312; (R) Tew, *The Oakham Canal*, 11:304; (R) Williams, *The Draining of the Somerset Levels*, 12:345; (R) Catling, *The Spinning Mule*, 16:88; (R) Donaghy, *Liverpool and Manchester Railway Operations*, 16:490; (R) Rolt, *Waterloo Ironworks*, 17:378

Hills, Richard L., and D. Patrick, *Beyer, Peacock*, (R) 24:695

Hills, Richard L., and A. J. Place, "The Measurement of Power in Early Steam-driven Textile Mills," 13:25

Matching steam engines to the machines they drove required learning how to measure power, a problem solved in the late eighteenth century; awarded 1973 Abbott Payson Usher Prize.

Hilton, Alice Mary, ed., *The Evolving Society*, (R) 8:524

Hilton, George W., "The Dossin Great Lakes Museum," 11:289

Operated by the Detroit Historical Commission, the museum successfully relies on a series of models to illustrate the history of shipping on the lakes.

———, *The Great Lakes Car Ferries*, (R) 4:357; (R) Mead, *Busted and Still Running*, 11:107; *The Transportation Act of 1958*, (R) 12:115; *The Cable Car in America*, (R) 14:640; (R) Rakowski, *Transportation Economics*, 18:750; (R) Cheape, *Moving the Masses*, 22:180; (R) Plant, *Industries in Trouble*, 24:517; (R) Yates, *The Decline and Fall of the American Automobile Industry*, 25:363

Hilton, George W., and John F. Due, *The Electric Interurban Railways in America*, (R) 2:284

Hince, Kevin, *Conflict and Coal*, (R) 25:857

Hinckley, Ted C., (R) Evans, *Collis Potter Huntington*, 12:639

Hindle, Brooke, "Man against the Machine: Antitechnological Sentiments and Movements in History," 14:438

Notes on a session at SHOT's 1972 Washington meeting with papers by George Basalla on the nature/nurture controversy and distrust of technology, William Davenport on literary antitechnology, John Logsdon on the SST, and comments by David Grimsted.

———, [SHOT Bicentennial Meeting I,] 17:499

Summary of the first of four bicentennial sessions at SHOT's 1975 Washington meeting with papers by Eugene Ferguson on American technology, Nathan Rosenberg on technological interdependence, Bruce Sinclair on links between Canadian and U.S. technology, and comments by Paul Uselding.

———, "Repetition of Experiments and Reconstruction of Processes as a Method in History of Science and Technology," 18:486

Summary of a session at SHOT's 1976 Philadelphia meeting with papers by Samuel Devons on optics, James MacLachlan on experiment in Galileo's physics, Jon Eklund on eighteenth-century chemistry, and D. H. Avery on laboratory and field reconstruction of ancient processes.

———, "Major Interpretations of Technology and Society," 20:601

Summary of a session at SHOT's 1978 Pittsburgh meeting with papers by Langdon Winner on political theory and technical design and John Staudenmaier on themes in *T&C*.

———, "The Spirit of the Age: Science and Technology in 19th-Century America," 21:447

Summary of a session in the Edison Centennial Symposium at SHOT's 1979 Newark meeting with papers by Nathan Reingold on theory and

utility in nineteenth-century American science, Edwin Layton on science and technology as complementary disciplines with differing goals, and comments by Hindle.

———, "Case Studies in Anonymous Technology," 24:477
Summary of a session at SHOT's 1982 Philadelphia meeting with papers by Theodore Penn on the milldam remains of central New England, John Worrell on New England farmer-potters, Laurence Gross on skills in wool-card construction and operation, and comments by Richard Bushman.

———, "Technology through the 3-D Time Warp," 24:450
Artifacts may offer unique access to past technologies, but objects can be misleading without written sources.

———, "Bridge to the Future: A Symposium Commemorating the Centennial of the Brooklyn Bridge—New York City, May 18–20, 1983," 25:294
Conference report.

———, (R) Abbott, *Adventures in the World of Science*, 3:334; *David Rittenhouse*, (R) 6:465; (R) Brown, ed., *The Collected Works of Count Rumford*, 12:640; (R) Jeremy, ed., *Henry Wansey and His American Journal*, 12:642; (R) Wallace, *Rockdale*, 20:640; (R) Dolmetsch, ed., *282 Eighteenth-Century Prints of Colonial America*, 21:110; (R) Rock, *Artisans of the New Republic*, 21:507; (R) Kebabian and Lipke, eds., *Tools and Technologies*, 22:166; *Emulation and Invention*, (R) 25:660; *see also* Richardson, Edgar P.

———, ed., *America's Wooden Age*, (R) 17:748; *Early American Science*, (R) 18:534; *Material Culture in the Wooden Age*, (R) 23:666

Hine, Robert V., (R) Sherwood, *Exploration of Alaska*, 7:108

Hinkle, Roscoe C., (R) Maus, *A Short History of Sociology*, 5:123

Hinton, Kate; *see* Braun, Ernest

Hippen, James C., "Industrial Textile Machinery: Five North American Museums," 10:570
Collections of industrial textile machinery are available in nine North American museums, of which this review surveys five: Watkins Mill State Park, Lawson, Missouri; Upper Canada Village, Morrisburg, Ontario; Henry Ford Museum and Greenfield Village, Dearborn, Michigan; Old Slater Mill Museum, Pawtucket, Rhode Island; and Little Red Shop, Hopedale, Massachusetts.

———, (R) Aspin, *James Hargreaves and the Spinning Jenny*, 8:95

Hiram Martin Chittenden: His Public Career, G. B. Dodds, (R) 15:341

Hired Hands and Plowboys: Farm Labor in the Midwest, 1815–60, D. E. Schob, (R) 19:220

Hirsch, Leon V.; *see* Wilson, George W.

Hirsch, Susan E., *Roots of the American Working Class*, (R) 21:259

Hirsch, Walter; *see* Barber, Bernard

Hirschfeld, Gerhard, "Technology and the Idea of Mankind," 5:43
The Council for the Study of Mankind sponsored a May 1963 conference in Chicago, here introduced by its Executive Director and followed by abstracts of the papers presented by Kaplan (5:45), Reiffel (5:47), Wright, (5:49), Killian (5:52), and David (5:54).

Hirschmeier, Johannes, *The Origins of Entrepreneurship in Meiji Japan*, (R) 7:86

Hirsh, Richard P., (R) Daniels and Rose, eds., *Energy and Transport*, 25:362

Histoire des techniques: Technique et civilisations, technique et sciences, B. Gille, (R) 22:771

Histoire et prestige de l'Académie des sciences, 1666–1966, Musée du conservatoire national des arts et mètiers, (R) 9:126

"L'Histoire générale des techniques," M. Daumas, 1:415

Histoire générale des techniques, Vol. 1, *Les Origines de la civilisation technique*, M. Daumas, ed., (R) 4:336

Historia de la tecnología y la invención en México, R. Sánchez Flores, (R) 23:115

Historia magnetycznego zapisu obrazów [The history of magnetic video recording], R. Wajdowicz, (R) 16:106

Historia Mundi, Vol. 10, *Das 19. und 20. Jahrhundert*, F. Valjavec, ed., (R) 8:153

The Historian and the City, O. Handlin and J. Burchard, eds., (R) 5:620

"Historians and Modern Technology: Reflections on the Development and Current Problems of the History of Technology," R. Rürup, 15:161

Historic American Engineering Record, *Eli Whitney Armory Survey*, (R) 18:146

———, ed., *The Upper Peninsula of Michigan*, (R) 22:634

Historic Towns: Maps and Plans of Towns and Cities in the British Isles with Historical Commentaries, from Earliest Times to circa 1800, vol. 1, M. D. Jobel, ed., (R) 13:335

An Historical and Practical Essay on the Culture and Commerce of Tobacco, W. Tatham, (R) 12:104

Historical Aspects of Microscopy, S. Bradbury and G. L'E. Turner, eds., (R) 9:603

"Historical Considerations in Aviation Development: Transportation Engineering Conference, October 1968," E. M. Emme, 10:429

Historical Notes on the Wet-processing Industry, S. M. Edelstein, (R) 15:328

A Historical Outline of Architectural Science, H. J. Cowan, (R) 9:226

"Historical Relations of Science and Technology," 6:239

Notes on a session chaired by John Beer at SHOT's 1964 Montreal meeting with papers by Robert Multhauf on production of sal ammoniac, Derek Price on the independence of technology and science, and comments by Carl Condit and Robert Schofield.

"The Historical Relations of Science and Technology," 6:547

Symposium introduced by Beer (6:547), with papers by Price (6:553) and Multhauf (6:569), and comments by Condit (5:587) and Schofield (6:591).

Historical Studies in the Physical Sciences, vols. 4 and 5, R. McCormmach, ed., (R) 17:604; vol. 8, McCormmach and L. Pyenson, eds., (R) 19:596

"An Historiographic Revolution: Two Books on Early American Industrial Communities," 21:463

"The Historiography of American Technology," 11:1

Paper by Daniels (11:1), comments by Burke (11:22) and Layton (11:27), and Daniels' reply (11:32).

"The Historiography of Technology," A. Thackray, 14:434

"The Historiography of Technology," 15:1

Essays by Multhauf (15:1), Ferguson (15:13), and Layton (15:31), with comment by Price (15:42).

"History: Neglected Clue to Technological Change," L. Mumford, 2:230

History and Bibliography of "The New American Practical Navigator" and "The American Coast Pilot," J. F. Campbell, (R) 6:131

History and Development of Engineering, M. S. Gregory, (R) 14:288

History and Industrial Civilisation, R. A. Buchanan, (R) 21:652

A History and Philosophy of Fluidmechanics, G. A. Tokaty, (R) 13:498

A history and philosophy of modern technology [in Japanese], K. Yamada, (R) 9:105

The History and Philosophy of Technology, G. Bugliarello and D. B. Doner, eds., (R) 21:534

History and the Idea of Mankind, W. W. Wagar, ed., (R) 13:682

History as Applied Science: A Philosophical Study, W. Todd, (R) 14:525

History of Aeronautics and Astronautics: A Preliminary Bibliography, K. M. Dickson, (R) 11:485

The History of Airships, B. Clarke, (R) 6:315

"History of Astronautics Symposium: Mar del Plata, Argentina, October 1969," F. I. Ordway III, 11:407

History of Automation in Russia before 1917, A. V. Khramoi, (R) 11:324

History of Aviation and Cosmonautics, vol. 5, D. Anoshchenko, ed., (R) 10:468

History of Binary and Other Nondecimal Numeration, D. Glaser, (R) 25:142

The History of Broadcasting in the United Kingdom, A. Briggs, Vol. 1, *The Birth of Broadcasting,* (R) 4:103; Vol. 2, *The Golden Age of Wireless,* (R) 7:102

A History of Building Materials, N. Davey, (R) 3:323

A History of Building Types, N. Pevsner, (R) 18:239

"The History of Canadian Technology," A. E. Roos, 22:590

A History of Chemical Engineering, W. Furter, ed., (R) 24:716

A History of Chemistry, J. R. Partington, vol. 2, (R) 4:338; vol. 3, (R) 5:602; vol. 4, (R) 6:280

The History of Clocks and Watches, E. Bruton, (R) 22:302

A History of Computing in the Twentieth Century, N. Metropolis et al., eds., (R) 24:147

A History of Control Engineering, 1800–1930, S. Bennett, (R) 23:657

A History of Dams, N. Smith, (R) 14:621

History of Domestic Mammals in Central and Eastern Europe, S. Bökönyi, (R) 17:108

A History of Dyed Textiles, S. Robinson, (R) 12:90

A History of Egyptian Architecture: The Empire (New Kingdom), A. Badawy, (R) 10:603

A History of Electrical Engineering, P. Dunsheath, (R) 4:340

A History of Electricity and Magnetism, H. W. Meyer, (R) 13:630

A History of Engineering and Science in the Bell System, M. D. Fagen, ed., Vol. 1, *The*

Early Years (1875–1925), (R) 18:113; Vol. 2, *National Service in War and Peace (1925–1975)*, (R) 20:817

A History of Engineering Drawing, P. J. Booker, (R) 6:128

A History of Georgia Agriculture, 1732–1860, J. C. Bonner, (R) 7:105

History of Greek Fire and Gunpowder, J. R. Partington, (R) 2:272

History of Hydrology, A. K. Biswas, (R) 12:493

A History of Industrial Power in the United States, L. C. Hunter, Vol. 1, *Waterpower in the Century of the Steam Engine*, (R) 22:371

A History of Iron and Steelmaking in the United States, American Institute of Mining Engineers, (R) 3:320

A History of Machine Tools, 1700–1910, W. Steeds, (R) 11:305

The history of magnetic video recording [in Polish], R. Wajdowicz, (R) 16:106

A History of Mechanical Engineering, A. F. Burstall, (R) 5:439

A History of Mechanical Inventions, A. P. Usher, (R) 2:34

A History of Metallography: The Development of Ideas on the Structure of Metals before 1890, C. S. Smith, (R) 2:266

A History of Metallurgy, R. F. Tylecote, (R) 19:111

A History of Metals, L. Aitchison, (R) 2:166

A History of Metals in Colonial America, J. A. Mulholland, (R) 23:495

A History of Meteorology to 1800, H. H. Frisinger, (R) 19:522

The history of mining and metallurgy: Goals, means, and methods for study and research [in Swedish], E. Tholander, (R) 22:805

The History of Modern Astronomy and Astrophysics: A Selected Annotated Bibliography, D. H. De Vorkin, (R) 25:135

The History of Modern Culture, M. Parmelee, (R) 3:227

A History of Ottoman Architecture, G. Goodwin, (R) 13:67

The History of Penicillin Production, A. E. Elder, ed., (R) 12:355

A History of Platinum, D. McDonald, (R) 3:88

A History of Platinum and Its Allied Metals, D. McDonald and L. B. Hunt, (R) 25:853

A History of Printed Textiles, S. Robinson, (R) 12:90

History of Programming Languages, R. L. Wexelblat, ed., (R) 25:144

A History of Public Works in the United States, 1776–1976, E. L. Armstrong, ed., (R) 18:248

A History of Real Estate, Building and Architecture in New York City during the Last Quarter (1898), Real Estate Record Association, comp., (R) 13:516

History of Road Development in India, Central Road Research Institute, (R) 6:301

"History of Rocket Technology," 4:264
Notes on a session chaired by Eugene Emme at SHOT's 1962 Philadelphia meeting with papers by Edward Pendray on Goddard, Walter Dornberger on the V-2, John Hagen on Project Vanguard, and Simon Ramo on missile development.

"The History of Rocket Technology," E. M. Emme, ed., 4:377

The History of Rocket Technology, E. M. Emme, ed., (R) 6:668

The History of Rocketry and Space Travel, W. von Braun and F. I. Ordway III, (R) 9:250

The History of Science and Technology: A Select Bibliography for Students, K. J. Rider, (R) 9:274; 2d ed., (R) 12:687

"The History of Science and Technology in Slovakia," J. Tibensky, 8:480

"The History of Science and the History of Technology in the Undergraduate Curriculum," W. D. Lewis, 15:453

"The History of Scientific Instruments," 8:315
Notes on a session chaired by I. B. Cohen at SHOT's 1966 Washington meeting with papers by Silvio Bedini on colonial mathematical practitioners and Cyril Smith on materials for instruments.

A History of Space Flight, E. M. Emme, (R) 8:248

History of Standard Oil Company (New Jersey), 1927–1950: New Horizons, H. M. Larson et al., (R) 14:660

A History of Steamboating on the Upper Missouri River, W. E. Lass, (R) 5:613

History of Steel In Japan, E. Nishida, ed., (R) 17:559

A History of Tactical Communication Techniques, D. L. Woods, (R) 17:151

A History of Technology, vols. 1–5, C. Singer et al., eds., (R) 1:299 (special issue)

A History of Technology, Vols. 6 and 7, *The Twentieth Century, c. 1900 to c. 1950, Parts I and II*, T. I. Williams, ed., (R) 23:631

"The History of Technology: An Alternative View," M. Fores, 20:853

History of Technology: First Annual Volume, 1976, A. R. Hall and N. Smith, eds., (R) 18:738; vol. 2, (R) 21:633; vol. 5, (R) 23:234

"*A History of Technology*: Review Issue," 1:299
Introductory articles by Kranzberg (1:299), Singer (1:302), and Hall (1:311); general reviews by Mumford (1:320), Meighan (1:334), White (1:343), and Woodbury (1:345); critiques of particular technologies by Condit (1:349), Jacobs (1:359), Haden (1:364), Levey and Duveen (1:371), Rasmussen (1:376), Wik (1:381), Panseri (1:389), Rogers (1:394), Burstall (1:401), Higgins (1:408), and Rae (1:411); and reports of other multivolume works in French (Daumas, 1:415), Italian (Lenzi, 1:419), and Russian (Zvorikine, 1:421).
"*A History of Technology*: Some Editorial Reflections," A. R. Hall, 1:311
"The History of Technology and Public Policy," J. A. Tarr, 24:469
"The History of Technology as a Science and a Branch of Learning: A Soviet View," A. Zvorikine, 2:1
"History of Technology at Imperial College, London," N. A. F. Smith, 10:172
"The History of Technology in Soviet Russia and Marxist Doctrine," D. Joravsky, 2:5
A History of Textiles, K. Wilson, (R) 21:655
History of the Aircraft Piston Engine: A Brief Outline, S. D. Heron, (R) 3:209
History of the American Aircraft Industry: An Anthology, G. R. Simonson, ed., (R) 10:324
The History of the Barometer, W. E. K. Middleton, (R) 6:130
A History of the British Gas Industry, T. I. Williams, (R) 24:134
A History of the British Steel Industry, J. C. Carr et al., (R) 4:352
History of the Canadian National Railways, G. R. Stevens, (R) 15:110
A History of the Cornish China-Clay Industry, R. M. Barton, (R) 9:118
"The History of the Eisenhower-Strauss Plan for Water and Power Development in the Middle East," 11:217
Note on a luncheon address by Lewis Strauss at SHOT's 1969 Washington meeting.
History of the Gear-cutting Machine: A Historical Study in Geometry and Machines, R. S. Woodbury, (R) 1:186
"History of the Industrial Laboratory," 4:259
Notes on a session chaired by Cyril Smith at SHOT's 1962 Philadelphia meeting with papers by John Beer on European precedents, Kendall Birr on GE research, Mathew Josephson on Edison's research, and comments by Simon Marcson and Nathan Reingold.
History of the iron-carbon diagram [in Polish], E. Tyrkiel, (R) 12:652
The History of the King's Works, Vols. 1 and 2, *The Middle Ages*, R. A. Brown et al., (R) 6:269
The history of the Kolomna works: An account of the history of the Kolomna V. V. Kuibyshev diesel locomotive works covering 110 years (1863–1973) [in Russian], G. P. Effremtsev, (R) 16:643
History of the Lathe to 1850: A Study in the Growth of a Technical Element of an Industrial Economy, R. S. Woodbury, (R) 3:312
History of the Louisville & Nashville Railroad, M. Klein, (R) 14:637
The history of the marine turbine, part 1, The period of coal and steam, 1897–1927 [in Swedish], I. Jung, (R) 22:805
History of the Milling Machine: A Study in Technical Development, R. S. Woodbury, (R) 2:43
History of the Naval Weapons Center, China Lake, California, Vol. 1, *Origins of the Navy Rocket Program and the Naval Ordnance Test Station, Inyokern*, A. B. Christman, (R) 13:677; Vol. 2, *The Grand Experiment at Inyokern: Narrative of the Naval Ordnance Test Station during the Second World War and the Immediate Postwar Years*, J. D. Gerrard-Gough and Christman, (R) 20:674
A History of the North Wales Slate Industry, J. Lindsay, (R) 16:486
History of the Portland Cement Industry in the United States, R. W. Lesley, (R) 16:500
History of the sciences and technology [in Czech], vols. 1–3 (1968–70), L. Nový, ed., (R) 12:487
History of the Skyscraper, F. Mujica, (R) 19:533
The History of the Söderfors Anchor-Works, J. Lundström, (R) 11:625
"History of the Technology of Atomic Energy," 4:262
Notes on a session chaired by Ralph Sanders at SHOT's 1962 Philadelphia meeting with papers by Gerald Johnson on the military role, Richard Hewlett on reactor technology, and Lewis Strauss on Eisenhower's Atoms for Peace program.
History of the thermodynamics of alloys [in Polish], E. Tyrkiel, (R) 11:459
A History of the United States Atomic Energy Commission, Vol. 1, *The New World*,

1939/1946, R. G. Hewlett and O. E. Anderson, Jr., (R) 4:227; Vol. 2, *Atomic Shield, 1947/1952*, Hewlett and F. Duncan, (R) 15:506

A History of the United States Weather Bureau, D. R. Whitnah, (R) 3:332

A History of the Waterways Experiment Station, 1929–1979, G. Cotton, (R) 21:519

History of the White Oak Laboratory, 1945–1975, J. P. Smaldone, (R) 20:824

A History of the World, H. Thomas, (R) 22:160

A History of the World's Airlines, R. E. G. Davies, (R) 6:481

A History of Theory of Structures in the Nineteenth Century, T. M. Charlton, (R) 25:898

A History of Tin Mining and Smelting in Cornwall, D. B. Barton, (R) 9:491

A History of Tramways from Horse to Rapid Transit, R. J. Buckley, (R) 18:102

History of Western Oil Shale, P. L. Russell, (R) 22:653

A History of Western Technology, F. Klemm, (R) 1:178

A History of Woodworking Tools, W. L. Goodman, (R) 7:525

The History of Wool and Wool Combing, J. Burnley, (R) 13:495

Hitchcock, Henry-Russell, with William Seale, *Temples of Democracy*, (R) 19:126

"Hitler, I. G. Farben, and Synthetic Gasoline," T. P. Hughes, 7:514

Hitt, Rodney, *The Car Builder's Dictionary*, (R) 13:636; *Electric Railway Dictionary*, (R) 14:306

Hitz, Elizabeth, "Women in Technological History," 23:449
Summary of a session at SHOT's 1981 Milwaukee meeting with papers by Carole Shammas on preindustrial labor, Alice Messing on cookbooks, Rachel Maines on designer and artisan in the textile arts, Nan Knight on obstetric anesthesia, and Patricia Cline on mathematics teaching.

———, (R) Hudson, *The West Riding Wool Textile Industry*, 17:610

Hix, John, *The Glass House*, (R) 16:498

Ho Ping-ti, *The Cradle of the East*, (R) 18:80

Ho Ping-yu; *see* Needham, Joseph

Hoagland, Hudson; *see* Cox, Harvey

Hoberman, Louisa Schell, "Technological Change in a Traditional Society: The Case of the *Desagüe* in Colonial Mexico," 21:386
Controversy around building and maintaining an eight-mile-long flood control drainage tunnel in the Valley of Mexico during the seventeenth and eighteenth centuries shows how social values may shape technical decisions.

Hobsbawm, E. J., *The Age of Capital*, (R) 18:250

Hodas, Daniel P., *The Business Career of Moses Taylor*, (R) 19:123

Hoddeson, Lillian, "The Emergence of Basic Research in the Bell Telephone System, 1875–1915," 22:512
Internal demands posed by increasingly complex technical problems played a significant role in expanding scientific research decades before the founding of Bell Labs.

Hodge, Carle, ed., *Aridity and Man*, (R) 6:138

Hodge, M. J. S., (R) Knight, *The Nature of Science*, 20:630

Hodges, Henry, *Technology in the Ancient World*, (R) 12:89

Hodges, Paul C., *The Life and Times of Emil H. Grubbe*, (R) 7:241

Hoelscher, H. E., and M. C. Hawk, eds., *Industrialization and Development*, (R) 12:362

Hoffecker, Carol E., "An Historiographic Revolution: Two Books on Early American Industrial Communities," 21:463
Summary of a symposium at SHOT's 1979 Newark meeting with remarks by Glenn Porter on Merritt Smith's *Harper's Ferry Armory* and Anthony Wallace's *Rockdale*, followed by comments from the authors.

———, *Wilmington, Delaware*, (R) 16:639; (R) Hareven and Langenbach, *Amoskeag*, 21:679

Hoffman, Abraham, *Vision or Villainy*, (R) 24:536; (R) Blake, *Land into Water*, 25:160

Hoffman, Myron A., (R) Stuhlinger et al., eds., *Astronautical Engineering and Science*, 5:264

Hoffman, Nathan J., (R) NASA, *Astronautics and Aeronautics, 1963*, 6:669

Hoffmann, Charles, *The Chinese Worker*, (R) 16:672

Hoffmann, Donald, *Frank Lloyd Wright's Fallingwater*, (R) 20:645

Hoffmann, Herbert, and Patricia F. Davidson, *Greek Gold*, (R) 7:413

Hofmann, Joseph Ehrenfried, *Classical Mathematics*, (R) 2:86

Hogg, O. F. G., *The Royal Arsenal*, (R) 5:255

Hogg, Peter C., *The African Slave Trade and Its Suppression*, (R) 15:516

Hoggatt, Austin, (R) Adelman and Morris,

Economic Growth and Social Equity in Developing Countries, 16:678
The Hoghead: An Industrial Ethnography of the Locomotive Engineer, F. C. Gamst, (R) 24:522
Hohenberg, Paul M., and Frederick Krantz, eds., *Failed Transitions to Modern Industrial Society*, (R) 18:94
Hohenemser, Christoph, and Jeanne X. Kasperson, eds., *Risk in the Technological Society*, (R) 24:311
Hoke, Donald, "The Rise of the American System of Manufactures, 1800–1870: Smithsonian Institution, March 1978," 21:67
Topics included economic versus non-economic factors, the British contribution, American conditions, the role of the military, precision measurement, the move from arsenal to factory, effect on management, impact on workers, role of marketing, and role of cultural values.
———, (R) Grant, *Yankee Dreamers and Doers*, 18:253; (R) Maddison and Turner, *Watches*, 20:360; (R) Bailey, *Two Hundred Years of American Clocks and Watches*, 20:805; (R) Crom, *Horological Shop Tools*, 23:271; (R) Post, ed., *Collector's Guide to Antique Typewriters*, 24:721
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———, "Electricity and Ideology," 18:482
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———, "Conceptual Definitions: Order out of Chaos," 18:512
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———, "La plus ça change . . . ," 19:608
Communication responding to van Riemsdijk, 19:606.

———, (R) English, *The Textile Industry*, 11:636; (R) Leavitt, ed., *The Hollingworth Letters*, 11:637; (R) Erickson, *Invisible Immigrants*, 15:497; (R) Sandberg, *Lancashire in Decline*, 17:158; (R) Anderson, *Family*

Structure in Nineteenth Century Lancashire, 17:549; (R) McCutcheon, *Wheel and Spindle,* 19:551; (R) Ponting and Chapman, eds., *Textile History,* 20:361; *Transatlantic Industrial Revolution,* (R) 23:641

———, ed., *Henry Wamsey and His American Journal,* (R) 12:642

Jerome, John, *Truck,* (R) 19:257

Jervis, Jane L., (R) Merchant, *The Death of Nature,* 23:653

Jervis, John B., *The Reminiscenes of John B. Jervis,* N. FitzSimons, ed., (R) 12:649

The Jet Age: Forty Years of Jet Aviation, W. J. Boyne and D. S. Lopez, eds., (R) 22:200, 22:641

The Jet Makers: The Aerospace Industry from 1945 to 1972, C. D. Bright, 21:135

Jethro Tull: His Influence on Mechanized Agriculture, G. E. Fussell, (R) 15:98

Jevons, F. R., "The Interaction of Science and Technology Today; or, Is Science the Mother of Invention?" 17:729

In the modern world, science rarely mothers invention but may foster innovation.

———, *Science Observed,* (R) 16:120; *Knowledge and Power,* (R) 18:723

"A Jeweler's Shop (1533)," C. S. Smith, 8:207

Jewett, Richard L., (R) Newcomen Society, *Transactions,* 5:277

Jewett, Robert A., "Structural Antecedents of the I-Beam, 1800–1850," 8:346

The "I" shape evolved sporadically and independently in iron rails, ship frames, floor beams, and bridge girders; cf. Dorn, 9:415.

———, "The Response," 9:419

In answer to criticism by Dorn, 9:415.

———, "Solving the Puzzle of the First American Structural Rail-Beam," 10:371

True production began in 1854, although a limited amount of rail rolled for the Camden & Amboy in 1849 may be styled "I-beam."

Jimmy Doolittle: Daredevil Aviator and Scientist, C. V. Glines, (R) 14:653

"The Joan Cahalin Robinson Prize," 22:559; 23:439; 24:465; 25:602

Awarded for the best-presented paper by a novice historian of technology at a SHOT annual meeting; first to J. Lauritz Larson in 1980, later to Christopher Hamlin (1981), Mona Spangler Phillips (1982), and Larry Owens (1983).

Jochmann, Ernst-Otto, *Die Entwicklung des Hochdruckdampfes in Deutschland,* (R) 2:178

Joedicke, Jürgen, *Shell Architecture,* (R) 6:476

John, Angela V., *By the Sweat of Their Brow,* (R) 23:263

John, E. Roy, *Neurometrics,* (R) 19:583

The John Bull: 150 Years a Locomotive, J. H. White, Jr., (R) 23:639

John Dalton: Critical Assessments of His Life and Science, A. Thackray, (R) 15:100

John Dee on Astronomy: "Propaedeumata aphoristica" (1538 and 1568), Latin and English, W. Shumaker, ed. and trans., (R) 20:790

"John Dover, Instrument Maker (1824–1881)," J. T. Stock and P. S. Laurie, 21:51

"John H. Hall, Simeon North, and the Milling Machine: The Nature of Innovation among Antebellum Arms Makers," M. R. Smith, 14:573

John M. Brooke: Naval Scientist and Educator, G. M. Brooke, Jr., (R) 23:673

John Rennie, 1761–1821: The Life and Work of a Great Engineer, C. T. G. Boucher, (R) 6:121

John Rogers: Tudor Military Engineer, L. R. Shelby, (R) 11:102

John Scott Russell: A Great Victorian Engineer and Naval Architect, G. S. Emmerson, (R) 19:767

John Taylor, Mining Entrepreneur and Engineer, 1779–1863, R. Burt, (R) 20:637

John von Neumann and Norbert Wiener: From Mathematics to the Technologies of Life and Death, S. J. Heims, (R) 23:108

"John W. Abrams (1913–1981)," B. Sinclair, 23:527

Johns, Patricia, *Matthew Fontaine Maury and Joseph Henry,* (R) 3:189

Johnson, Arthur M., (R) Helfgott et al., *Made in New York,* 3:194; (R) Butlin, *Investment in Australian Economic Development,* 6:287; (R) Salsbury, *The State, the Investor, and the Railroad,* 10:317; (R) Darrah, *Pithole,* 14:311; (R) Allvine and Tarpley, *The New State of the Economy,* 19:743

Johnson, Chalmers, ed., *Change in Communist Systems,* (R) 12:521

Johnson, Christopher H., (R) Sewell, *Work and Revolution in France,* 24:675

Johnson, David L.; *see* Pytlik, Edward C.

Johnson, Donald E., and James E. Mooney, *Pioneer Class,* (R) 8:239

Johnson, Fridolf.; *see* Hornung, Clarence P.

Johnson, Harry G., *Economic Policies toward Less Developed Countries,* (R) 10:133; *Technology and Economic Interdependence,* (R) 19:241

Johnson, Leland R., *The Headwaters District,* (R) 22:313

Johnson, Marion; *see* Lewicki, Tadeusz

Johnson, Nicholas L., *Handbook of Soviet Lunar and Planetary Science* and *Handbook of Soviet Manned Space Flight,* (R) 23:520

Johnson, Walter, ed., *The New Daguerreian Journal,* (R) 13:525

Johnston, Angus James, II, *Virginia Railroads and the Civil War,* (R) 3:337

Johnston, Bruce F.; *see* Southworth, Herman M.

Johnston, L. D., (R) Nieburg, *Nuclear Secrecy and Foreign Policy,* 6:154

Johnston, Ron, and Philip Gummett, eds., *Directing Technology,* (R) 21:151

Johnston, S. Paul, (R) Scharff and Taylor, *Over Land and Sea,* 10:326

Joint Economic Committee Staff, *Chinese Economy,* (R) 22:686

Jolliffe, A. W., (R) Albertus Magnus, *Book of Minerals,* 9:219

Jones, Arthur F., *The Art of Paul Sawyier,* (R) 18:565

Jones, Daniel P., "From Military to Civilian Technology: The Introduction of Tear Gas for Civil Riot Control," 19:151

When local police forces in the 1920s replaced federal troops in riot control, the one-time battlefield weapon became a mainstay of civil action.

Jones, Geoffrey, *The State and the Emergence of the British Oil Industry,* (R) 24:132

Jones, Howard Mumford, "Ideas, History, Technology," 1:20

Despite some unsolved problems of its own, history of technology may yet help free general history from its preoccupation with literary evidence.

Jones, John Hugh; *see* Berry, Donald S.

Jones, Stacy V., *Weights and Measures,* (R) 5:276; *Inventions Necessity Is Not the Mother Of,* (R) 16:333

Jones, Thomas B., "Science, Technology, and Human Values: Spring Hill Center, Wayzata, Minnesota, April 13–16, 1980," 22:598

Seeking to better define the role of humanist thought in solving technological problems, the conference began with case studies in life-sustaining technology, computers and privacy, nuclear wastes and future generations, and energy resources and transportation; workshops then addressed future issues, social and political life, environment, work, and human nature.

Joravsky, David, "The History of Technology in Soviet Russia and Marxist Doctrine," 2:5

Commenting on Zvorikine, 2:1.

———, *Soviet Marxism and Natural Science,* (R) 4:123

Jordan, Sonja, *Die kaiserliche Wirtschaftspolitik im Banat im 18. Jahrhundert,* (R) 10:314

Jorgensen, Paul A., (R) O'Neil, *Castles and Cannon,* 3:91

Jorpes, J. Erik, *Jac. Berzelius,* (R) 13:73

Joseph Bramah: A Century of Invention, 1743–1841, I. McNeil, (R) 16:488

Joseph Fourier, 1768–1830, I. Grattan-Guiness, (R) 14:501

Josephson, Matthew, *Edison,* (R) 1:284

"Josiah Wedgwood and the Technology of Glass Manufacturing," R. E. Schofield, 3:285

"Joule, Heat, and Work," J. Molgaard, 20:686

Journal of Glass Studies, P. N. Perrot, ed., vol. 8, (R) 8:215; vol. 9, (R) 9:113; vol. 10, (R) 10:346; vol. 11, (R) 11:664; vol. 12, (R) 12:681; vol. 13, (R) 14:110; J. S. Spillman, ed., vol. 15, (R) 16:619; J. H. Martin, ed., vol. 16, (R) 17:601; vols. 17 and 18, (R) 18:746; vol. 19, (R) 19:728; vol. 20, (R) 21:481; vol. 21, (R) 22:162; vol. 22, (R) 23:269

Journal of Modern History, vol. 51, no. 2, special issue on "Technology and War," (R) 21:635

Journal of the Patent Office Society, vol. 47, no. 7/8, special issue devoted to the "175th Anniversary Symposium of the U.S. Patent System," (R) 7:546

Journal of Urban History, vol. 5 (May 1979), special issue on "The City and Technology," J. A. Tarr, ed., (R) 21:637

Journey to Labor: A Study of Births in Hospitals and Technology, D. M. Pappenfort, (R) 7:134

Jousse, Mathurin, "Fidelle ouverture de l'art de serruier," C. S. Smith and A. Sisco, eds. and trans., 2:131

Judd, Jacob, "America's Wooden Age: Sleepy Hollow Restorations, April 1973," 15:64

A conference in Tarrytown, New York, addressed the effects of an abundant wood supply on colonial society and culture.

———, (R) Carroll, *The Timber Economy of Puritan New England,* 15:494; *see also* Frese, Joseph R.

Judson, Horace Freeland, *The Search for Solutions,* (R) 23:97

Jung, Ingmar, *Marinturbinens historia,* (R) 22:805

Juniper Waterway: A History of the Albemarle and Chesapeake Canal, A. C. Brown, (R) 25:658

Junker, Louis J., (R) Keenleyside, *International Aid*, 9:629; (R) Maizels, *Exports and Economic Growth of Developing Countries*, 11:330

Juptner, Joseph P., *U.S. Civil Aircraft*, (R) 23:272

Jurdant, Baudoin, and Michel Paty, eds., *Fundamenta Scientiae*, (R) 23:98

K. Marks i problemy tekhniki [Karl Marx and the problems of technology], A. A. Kuzin, (R) 11:326

Kagame, A.; *see* Gardet, L.

Kahler, Erich, *The Meaning of History*, (R) 6:535

Kahn, Arthur D., " 'Every Art Possessed by Man Comes from Prometheus': The Greek Tragedians and Science and Technology," 11:133
Sophocles evinced less enthusiasm for science and technology than Aeschylus, Euripides still less than Sophocles.

Kahn, Herman, William Brown, and Leon Martel, *The Next 200 Years*, (R) 18:585

Kahrl, William L., *Water and Power*, (R) 24:538

Kain, J. F.; *see* Meyer, J. R.

Die kaiserliche Wirtschaftspolitik im Banat im 18. Jahrhundert, S. Jordan, (R) 10:314

Kakar, Sudhir, *Frederick Taylor*, (R) 12:666

Kalachek, Edward D.; *see* Nelson, Richard R.

Kallab, Valeriana; *see* Erb, Guy F.

Kamerschen, David R., (R) Clairmonte, *Economic Liberalism and Underdevelopment*, 4:366

Kammen, Michael, (R) Schrier and Story, eds., *A Russian Looks at America*, 22:168

Kanefsky, John, and John Robey, "Steam Engines in 18th-Century Britain: A Quantitative Assessment," 21:161
Approximately 2,500 steam engines installed mainly in mines and textile mills during the eighteenth century demonstrate the rapid adoption of a key innovation in critical economic sectors.

Kann, Henry Robert, (R) Condit, *The Chicago School of Architecture*, 6:472

Kannappan, Subbiah, (R) Hoselitz, ed., *Economics and the Idea of Mankind*, 7:129

Kanter, Rosabeth Moss, *Work and Family in the United States*, (R) 19:129

Kaplan, Bonnie, "Technological Innovation in Medicine: Social Influences and Consequences," 25:619
Summary of a session at SHOT's 1983 Washington meeting with papers by Kaplan on medical computing, Joel Howell on failure of the ballistocardiogram, Audrey Davis on anesthetics and hospitals, and comment by Charles Süsskind.

Kaplan, Joseph, "Space and International Cooperation," 5:45
Space activities may, like the IGY program, foster international scientific cooperation; abstract of a paper from the conference, "Technology and the Idea of Mankind," 5:43, with a summary of the discussion that followed.

Kaplan, Max, *Leisure in America*, (R) 2:431

Kaplan, Morton A., ed., *The Revolution in World Politics*, (R) 5:122

Kaplan, Norman, (R) Krohn, *The Shaping of Science*, 12:671; (R) Schooler, *Science, Scientists, and Public Policy*, 13:332; (R) Merton, *The Sociology of Science*, 15:659; (R) Cole and Cole, *Social Stratification in Science*, 15:662; (R) Gaston, *Originality and Competition in Science*, 15:664

———, ed., *Science and Society*, (R) 7:570

Kapp, Ernst, *Grundlinien einer Philosophie der Technik*, (R) 21:276

Kapp, Louis; *see* Cohen, Eli E.

Kapstein, Ethan Barnaby, "The Solar Cooker," 22:112
Funded by the Rockefeller Foundation during the 1940s and 1950s, Farrington Daniels and his University of Wisconsin colleagues attempted to develop solar technology for the Third World.

———, (R) Boeri and Gibson, *Tell It Goodbye, Kiddo*, 18:716; (R) Bockstoce, *Steam Whaling in the Western Arctic*, 19:133; (R) Butti and Perlin, *A Golden Thread*, 21:650; (R) Schmitt et al., *Thomas Welcome Roys*, 23:124

Kargon, Robert H., (R) National Academy of Sciences, *Biographical Memoirs*, 17:395; *Science in Victorian Manchester*, (R) 21:660; (R) Smith and Weiner, eds., *Robert Oppenheimer*, 22:649; *The Rise of Robert Millikan*, (R) 25:138

Karl Marx: Exzerpte über Arbeitsteilung, Maschinerie und Industrie, R. Winkelmann, ed., (R) 25:648

Karl Marx: Die technologisch-historischen Exzerpte, H.-P. Müller, (R) 25:648

Karl Marx and the problems of technology [in Russian], A. A. Kuzin, (R) 11:326

Karlsson, Lars Erik; *see* Burns, Tom R.
Kármán, Theodore von, with Lee Edson, *The Wind and Beyond*, (R) 9:507
Karregeannes, Carrie E.; *see* Wells, Helen T.
Karrow, Robert W., Jr., "Was John Marmin's 'Self-propelled Vehicle' a Sailcar?" 24:493
Why the answer may be yes, with an ultimately Chinese source; cf. Alsop, 22:753.
Kash, Don E., *The Politics of Space Cooperation*, (R) 10:126
Kash, Don E., and I. L. White, *Energy under the Oceans*, (R) 16:122
Kash, Don E., and the University of Oklahoma Science and Public Policy Program, *Our Energy Future*, (R) 18:720
Kasper, Raphael G., *Technology Assessment*, (R) 13:686; *see also* Ebbin, Steven
Kasperson, Jeanne X.; *see* Hohenemser, Christoph
Kasschau, Richard A., Roy Lachman, and Kenneth R. Laughery, eds., *Information Technology and Psychology*, (R) 25:849
Kasson, John F., "Technological Change and the Culture of the Workplace," 20:602
Summary of a session at SHOT's 1978 Pittsburgh meeting with papers by Richard Horwitz on interpreting technology and culture, Randolph Langenbach on architecture and planning at Lowell, David Noble on numerical control of machine tools, and comments by David Montgomery.
———, *Civilizing the Machine*, (R) 18:250; (R) Folsom and Lubar, eds., *The Philosophy of Manufactures*, 24:680; (R) Richardson et al., *Charles Willson Peale and His World*, 25:876
Kates, Robert W.; *see* Burton, Ian
Kato Hidetoshi, (R) Kouwenhoven, *The Beer Can by the Highway*, 4:116
Katona, George, *The Mass Consumption Society*, (R) 6:525
Katz, Michael B., Michael J. Doucet, and Mark J. Stern, *The Social Organization of Early Industrial Capitalism*, (R) 24:678
Katzen, May, ed., *Multi-media Communications*, (R) 25:687
Katzman, Natan; *see* Comstock, George
Kauffman, Henry J., *The Pennsylvania-Kentucky Rifle*, (R) 6:126; *American Axes*, (R) 14:83
Kaufman, Carl B., *Man Incorporate*, (R) 11:649
Kay, G. B., ed., *The Political Economy of Colonialism in Ghana*, (R) 14:517
Kay, Russell; *see* Wachsmann, Klaus P.
Keachie, E. C., (R) Nelson et al., *Technology, Economic Growth, and Public Policy*, 9:263
Kealey, Edward J., *Medieval Medicus*, (R) 23:646
Kearns-Faure, Françoise, (R) Centre de documentation d'histoire des techniques, *Etudes pour un traitement automatique des sources en histoire des techniques*, 17:410
Keating, John D., *The Lambent Flame*, (R) 17:149
Kebabian, Paul B., and William C. Lipke, eds., *Tools and Technologies*, (R) 22:166
Kebabian, Paul B., and Dudley Witney, *American Woodworking Tools*, (R) 21:108
Keefer, T. C., *Philosophy of Railroads and Other Essays*, (R) 14:632
Keenleyside, Hugh L., *International Aid*, (R) 9:629
Kehoe, Alice B., (R) Chamberlain, *When the Stars Came Down to Earth*, 25:873
Keilty, Edmund, *Doodlebug Country*, (R) 25:164
Keir, Gillian; *see* Brooke, Christopher
Keive, Jeffrey L., *The Electric Telegraph*, (R) 15:332
Kekulé Centennial, American Chemical Society, (R) 8:500
Keller, Alex G., "A Renaissance Humanist Looks at 'New' Inventions: The Article 'Horologium' in Giovanni Tortelli's *De orthographia*," 11:345
The Latin text, an English translation, and a commentary on an often repeated fifteenth-century list of postclassic inventions.
———, "Archimedean Hydrostatic Theorems and Salvage Operations in 16th-Century Venice," 12:602
Classical mechanics revived in the Renaissance without the ancient disdain for manual labor.
———, "The Missing Years of Jacques Besson, Inventor of Machines, Teacher of Mathematics, Distiller of Oils, and Huguenot Pastor," 14:28
What Besson was doing in the 15 years before publication of *Théâtre des instrumens mathématiques et méchaniques* in 1572.
———, "The Third International Symposium on Molinology: The Netherlands, May 1973," 15:226
Preindustrial machinery of all kinds furnished material for two days of sessions and films, followed by two-and-a-half days of excursions to mills, many still working.
———, "Renaissance Theaters of Machines," 19:495

Essay review of Ferguson, ed., *The Various and Ingenious Machines of Agostino Ramelli;* and Branca, *Le Machine (1629).*

———, (R) Gille, *Les Ingénieurs de la Renaissance,* 6:271; *A Theatre of Machines,* (R) 7:527; (R) Purver, *The Royal Society,* 9:484; (R) Polvani, ed., *Le Machine,* 10:84; (R) Edelstein, *The Idea of Progress in Classical Antiquity,* 10:87; (R) Britkin, *The Craftsmen of Tula,* 10:608; (R) Maccagni, ed., *Atti del primo convegno internazionale di ricognizione delle fonti per la storia della scienza italiana,* 11:97; (R) Shelby, *John Rogers,* 11:102; (R) Parsons, *Engineers and Engineering in the Renaissance,* 12:337; (R) Gadol, *Leon Battista Alberti,* 12:632; (R) Davis, *Society and Culture in Early Modern France,* 17:368; (R) Beedell, *Windmills,* 18:92; (R) Hill, trans., *The Book of Ingenious Devices,* 21:231; (R) Ginzburg, *The Cheese and the Worms,* 23:650; (R) Hall, *The Technological Illustrations of the So-called "Anonymous of the Hussite Wars,"* 25:109; Vigueras González, *La tecnología portuaria del Siglo de Oro Español,* 25:332

Keller, Allan; *see* Howell, Charles

Kellermann, Rudolf; *see* Treue, Wilhelm

Kellermann, Rudolf, and Wilhelm Treue, *Die Kulturgeschichte der Schraube,* (R) 7:76

Kelley, Allen C., and Jeffrey G. Williamson, *Lessons from Japanese Development,* (R) 17:559

Kellogg, Charles E., and David C. Knapp, *The College of Agriculture,* (R) 8:121

Kelly, Patrick, (R) Taviss and Koivumaki, eds., *Implications of Biomedical Technology,* 12:158; (R) Taviss and Gerber, eds., *Technology and Work,* 12:158; (R) Taviss and Silverman, eds., *Technology and Values,* 12:158; (R) Taviss and Purbank, eds., *Technology and the Polity,* 12:158

Kelly, Patrick, and Melvin Kranzberg, eds., *Technological Innovation,* (R) 22:349

Kelly, Rebecca, "Interface '83—Humanities and Technology: Southern Technical Institute, Marietta, Georgia, October 20–21, 1983," 25:839
The seventh "Interface" conference addressed six broad topics: technology and the arts, computer uses and effects, philosophical and ethical concerns, interdisciplinary teaching, business communication and technical writing, and history of technology.

Kelsey, Benjamin S., *The Dragon's Teeth?* (R) 25:664

Kemeny, John G., *Man and the Computer,* (R) 14:665

Kemp, Emory L., (R) Pool, *America's Valley Forges and Valley Furnaces,* 25:347; (R) Charlton, *A History of Theory of Structures in the Nineteenth Century,* 25:898

Kemper, Peter, and John M. Quigley, *The Economics of Refuse Collection,* (R) 18:270

Kennedy, Duncan, *The Birth and Death of a Highland Railway,* (R) 13:77

Kennedy, George E., II, and John S. Tumlin, "Interface '78—Humanities and Technology: Southern Technical Institute, Marietta, Georgia, October 1978," 21:71
Sponsored by the institute's English and History Department, the second "Interface" conference, like the first, generally centered on pedagogy and curriculum design, literature, history of science and technology, and public policy.

———; *see also* Gates, Roberta D.

Kennedy, Khrushchev and the Test Ban, G. T. Seaborg, (R) 24:302

Kenricks in Hardware: A Family Business, 1791–1966, R. A. Church, (R) 16:489

Kenwood, A. G., and A. L. Lougheed, *Technological Diffusion and Industrialisation before 1914,* (R) 25:868

Kepes, Gyorgy, *Vision and Value,* (R) 7:132; *see also* Cox, Harvey

Kephart, Calvin, *Races of Mankind,* (R) 3:105

Kerker, Milton, "Science and the Steam Engine," 2:381
Scientific concerns, principles, and practices influenced every major development in steam technology from the seventeenth through the nineteenth century.

Kerr, Clark, John Dunlop, Frederick Harbison, and Charles Myers, *Industrialism and Industrial Man,* (R) 3:346

Kessler-Harris, Alice, *Out to Work,* (R) 24:686

Kevles, Daniel J., "Federal Legislation for Engineering Experiment Stations: The Episode of World War I," 12:182
On the significance of Senator Francis G. Newlands's bill and the reasons for its failure.

———, "Scientists, the Military, and the Control of Postwar Defense Research: The Case of the Research Board for National Security, 1944–1946," 16:20
Detailed account of one failed proposal.

———, "Big Science and Its Institutional Forms," 22:577

Summary of a session at SHOT's 1980 Toronto meeting with papers by Allan Needell on Brookhaven research reactors, Lillian Hoddeson on U.S. and Japanese proton accelerators, Joan Bromberg on fusion energy, and comments by Richard Hewlett.

———, *The Physicists,* (R) 22:329

Khami Ruins: Report on Excavations Undertaken for the Commission for the Preservation of Natural and Historical Monuments and Relics, Southern Rhodesia, 1947–1955, K. R. Robinson et al., (R) 1:100

Khare, Ravindra S., James W. Kolka, and Carol A. Pollis, eds., *Environmental Quality and Social Responsibility,* (R) 15:529

Khatri, Linda A.; *see* Roysdon, Christine M.

Khramoi, A. V., *History of Automation in Russia before 1917,* (R) 11:324

Kidney, Walter C., *The Architecture of Choice,* (R) 17:776

Kidwell, Claudia B., *Cutting a Fashionable Fit,* (R) 22:802

Kieffer, William F.; *see* Ihde, Aaron J.

Kikuchi, M.; *see* Hayami, Y.

Kilbridge, Maurice D., Robert P. O'Block, and Paul V. Teplitz, *Urban Analysis,* (R) 12:677

Kilgour, Frederick G., "Vitruvius and the Early History of Wave Theory," 4:282

Vitruvius advanced a detailed wave theory of sound, probably based on the Stoics, which was well-known in the seventeenth century.

———, (R) Multhauf, comp., *A Catalogue of Instruments and Models in the Possession of the American Philosophical Society,* 3:184; (R) Armytage, *A Social History of Engineering,* 5:68

Kill Devil Hill: Discovering the Secret of the Wright Brothers, H. Combs, (R) 22:339

Killian, James R., Jr., *Sputnik, Scientists, and Eisenhower,* (R) 19:779; *see also* Fuller, R. Buckminster

Killian, Thomas J., "Technology and Economic Productivity," 5:52

New levels of productivity raise a host of questions; abstract of a paper from the conference, "Technology and the Idea of Mankind," 5:43, with a summary of the discussion that followed.

Kim, M. P., ed., *Sotsial'no-ekonomicheskie problemy istorii razvitogo sotsializma v SSSR,* (R) 20:248

Kimball, Charles, "Toward Technology Transfer: Epilogue," 5:358

The conference reported by Schrier, 5:344, will meet again.

Kindelberger, Charles P., *Economic Growth in France and Britain,* (R) 6:285

King, Anthony D., *Colonial Urban Development,* (R) 19:217

King, David A., (R) Brecher and Feirtag, eds., *Astronomy of the Ancients,* 22:300

King, W. James, *The Development of Electrical Technology in the 19th Century,* (R) 4:340; (R) Süsskind, *Popov and the Beginnings of Radiotelegraphy,* 7:98; (R) Kompfner, *The Invention of the Traveling-Wave Tube,* 7:98; (R) Miessner, *On the Early History of Radio Guidance,* 7:98

Kingery, R. A., R. D. Berg, and E. H. Schillinger, *Men and Ideas in Engineering,* (R) 9:239

Kingsford, P. W., *Engineers, Inventors, and Workers,* (R) 6:276

Kingslake, R., (R) Volkmann, *Carl Zeiss und Ernst Abbe,* 9:235

Kintner, William R., and Harvey Sicherman, *Technology and International Politics,* (R) 17:562

Kipp, Jacob W.; *see* Hagan, Kenneth J.; *see also* Higham, Robin

Kipp, Lawrence J., ed., *Source Materials for Business and Economic History,* (R) 9:275

Kircher, Paul; *see* Steele, George

Kirchner, Walther, (R) Konvitz, *Cities and the Sea,* 21:646

Kirker, Harold, *The Architecture of Charles Bulfinch,* (R) 12:347

Kirker, Harold, and James Kirker, *Bulfinch's Boston,* (R) 6:468

Kirker, James; *see* Kirker, Harold

Kisch, Bruno, *Scales and Weights,* (R) 8:402

Kistiakowsky, George B., *A Scientist at the White House,* (R) 19:779

Kitti, Carole, "Technology Indicators: Recent Developments in the Use of Patent Data," 24:473

Summary of a session at SHOT's 1982 Philadelphia meeting with papers by Jennifer Bond on patent statistics and inventive activity, Claudia Thompson on patent citation analysis, Francis Narin on links between patents and basic research, and comments by Thomas Hughes, Roberta Miller, and Robert Post.

Kittler, Glenn D.; *see* Steirman, Hy

Klapper, Charles, *The Golden Age of Tramways,* (R) 16:98

Klass, Morton, *From Field to Factory,* (R) 20:839

Klass, Philip J., *Secret Sentries in Space,* (R) 13:678

Klaw, Spencer, *The New Brahmins,* (R) 10:473

Klawonn, Marion J., *Cradle of the Corps,* (R) 21:120

Klein, Martin J., (R) Segrè, *Enrico Fermi,* 12:507

Klein, Martin S.; *see* Wilson, George W.

Klein, Maury, *History of the Louisville & Nashville Railroad,* (R) 14:637; (R) Martin, *James J. Hill and the Opening of the Northwest,* 18:698

Klein, Stanley, "Wanted: More Engineers in Public Affairs: The EJC Symposium on National Engineering Problems," 6:416

In January 1964, the Engineers Joint Council sponsored a symposium in Washington; U.S. government officials addressed an elite group of engineers about the growing importance in public affairs of science and technology and discussed a broad range of R & D concerns.

———, (R) Teller, *The Legacy of Hiroshima,* 3:359; (R) Hewlett and Anderson, *The New World,* 4:227; (R) Eisenbud, *Environmental Radioactivity,* 5:101

Kleinberg, Susan J., [Works-in-progress I,] 21:464

Summary of a session at SHOT's 1979 Newark meeting with papers by Leedom Lefferts and David Peifer on the HAER inventory of northwestern New Jersey, Allan Comp on HAER itself, Donald Hole on the Aurora Watch Company and the American system, Betsy Woodman on Charles T. James and antebellum mill engineers, Stephen Victor on the American haircloth industry, and Howard Segal on technological utopianism.

Kleine, Peter, *Die Architektur der Nordatlantik-Passagierdampfer,* (R) 9:617

Kleine Geschichte der Technologie, A. Timm, (R) 6:448

Klemm, Friedrich, *A History of Western Technology,* (R) 1:178; *Kurze Geschichte der Technik,* (R) 4:52; (R) Kisch, *Scales and Weights,* 8:402; *see also* Treue, Wilhelm

Klemperer, Wolfgang B., (R) Halle, *Otto Lilienthal,* 4:94

Kley, Ronald J., (R) Chenhall, *Museum Cataloging in the Computer Age,* 17:614

Klunder, Willard C., (R) Dickinson, *To Build a Canal,* 23:672

Knaack, Marcelle S., *Encyclopedia of U.S. Air Force Aircraft and Missile Systems,* (R) 20:826

Knapke, William F., *The Railroad Caboose,* (R) 9:614

Knapp, David C., *see* Kellogg, Charles E.

Knaurs Geschichte der Technik, C. G. von Klinckowstroem, (R) 7:229

The Knibb Family—Clockmakers, R. A. Lee, (R) 5:608

Knight, David, *The Nature of Science,* (R) 20:630

Knight, Richard V.; *see* Stanback, Thomas M., Jr.

Knight, Thomas J., (R) Miles, *Awakening from the American Dream,* 18:140; *Technology's Future,* (R) 20:397; (R) Thomas, *A History of the World,* 22:160

Knights, Peter R., (R) Codding, *The Universal Postal Union,* 6:480; (R) Barnouw, *A Tower in Babel,* 8:510

Knodel, John E., *The Decline of Fertility in Germany,* (R) 17:389

Knorr-Cetina, Karin D., *The Manufacture of Knowledge,* (R) 25:130

"The 'Know-How' Tradition: Technology in American History," J. B. Rae, 1:139

Knowledge and Power: Lectures by F. R. Jevons, C. E. West, ed., (R) 18:723

Knowlton, Evelyn H.; *see* Larson, Henrietta M.

The Known and the Unknown: The Iconography of Science Fiction, G. K. Wolfe, (R) 23:697

Ko Hung, *Alchemy, Medicine, and Religion in the China of A.D. 320,* J. R. Ware, trans. and ed., (R) 10:90

Kobayashi Tatsuya, (R) Ohkawa and Rosovsky, *Japanese Economic Development,* 15:347; (R) Allinson, *Japanese Urbanism,* 18:257; (R) Nakayama, *Characteristics of Scientific Development in Japan,* 21:156; *Gijitsu iten, rekishi kara no kosatsu,* (R) 23:642

Koch, Michael, *The Shay Locomotive,* (R) 13:316

Koenigsberger, Dorothy, (R) Cosman and Chandler, eds., *Machaut's World,* 25:328

Koeper, Frederick; *see* Whiffen, Marcus

Kohler, Robert E., "The Interaction of Science and Technology in the Industrial Age: Foreword," 17:621

An introduction to the conference so titled.

Kohlmeyer, Fred W., (R) Bogue, *From Prairie to Corn Belt,* 5:454; (R) Bonner, *A History of Georgia Agriculture,* 7:105; (R) Iowa State University, *Economic Development of Agriculture,* 8:415; (R) Fussell, *The English Dairy Farmer,* 9:117; (R) Adler, *Claus Spreckels,* 10:320; (R) "Eighteenth-Century Agriculture," 11:301; (R) Greenberg, ed., *Land That Our Fathers Plowed,* 11:303; (R) Šmelhaus and Tempir, eds., *Acta Museorum*

Agriculturae, 11:477; (R) Herndon, *William Tatham and the Culture of Tobacco*, 12:104; (R) Danhof, *Change in Agriculture*, 12:105; (R) Moores, *Fields of Rich Toil*, 13:641; (R) Fussell, *Crop Nutrition* and *Jethro Tull*, 15:98; *Timber Roots*, (R) 17:158; (R) Young, *The Virginia Agricultural Experiment Station*, 17:545; (R) Rasmussen, ed., *Agriculture in the United States*, 18:96; (R) Arndt et al., eds., *Resource Allocation and Productivity in National and International Agricultural Research*, 19:135; (R) Fite, *Beyond the Fence Rows*, 21:111

Kohlmeyer, Fred W., and Floyd L. Herum, "Science and Engineering in Agriculture: A Historical Perspective," 2:368

Agriculture's technological conservatism delayed the emergence of agricultural engineering until late in the nineteenth century.

Kohlstedt, Sally Gregory, *The Formation of the American Scientific Community*, (R) 17:758

Koivumaki, Judith; see Taviss, Irene

Kolaja, Jiri, *A Polish Factory*, (R) 3:103

Kolankiewicz, George; *see* Lane, David

Kolin, Ivo, *Thermodynamics Atlas*, (R) 15:641

Kolka, James W.; *see* Khare, Ravindra S.

Kolnicker, Morris, (R) Weeks, ed., *Machines and the Man*, 3:203; (R) Buckingham, *Automation*, 3:203; (R) Dunlop, ed., *Automation and Technological Change*, 5:103; (R) Donovan, *Wheels for a Nation*, 7:551

Komons, Nick A., *Bonfires to Beacons*, (R) 21:525

Kompfner, Rudolf, *The Invention of the Traveling-Wave Tube*, (R) 7:98

Konvitz, Josef W., *Cities and the Sea*, (R) 21:646; (R) Hoy et al., eds., *Essays in Public Works History*, 25:356

Koob, Katherine R.; *see* Leavitt, Thomas W.

Koop, A. J.; *see* Wakameda, T.

Kopp, Anatole, *Town and Revolution*, (R) 12:520

Koppes, Clayton R., (R) Anderson, *Orders of Magnitude*, 18:558; (R) Newell, *Beyond the Atmosphere*, 23:516

Korbin, Stephen Jay, *Foreign Direct Investment, Industrialization, and Social Change*, (R) 20:662

Korman, Gerd, *Industrialization, Immigrants, and Americanizers*, (R) 10:109

Korneyev, S. C., ed., *USSR Academy of Sciences*, (R) 19:769

Kornhauser, Arthur, *Mental Health of the Industrial Worker*, (R) 6:670

Kornhauser, William, *Scientists in Industry*, (R) 5:115

Kornwolf, James D., *M. H. Baillie Scott and the Arts and Crafts Movement*, (R) 14:301; (R) Morton, *Three Generations in a Family Textile Firm*, 21:658

Korol, Alexander G., *Soviet Research and Development*, (R) 8:132

Korson, George, *Black Rock*, (R) 2:408

Körting, Johannes, *Geschichte der deutschen Gasindustrie*, (R) 7:82

Kostelanetz, Richard, ed., *Beyond Left and Right*, (R) 11:120

Kostof, Spiro, ed., *The Architect*, (R) 20:650

Kouwenhoven, John A., "Architecture as Environmental Technology," 11:85

Essay review of Banham, *The Architecture of the Well-tempered Environment*.

———, "The Designing of the Eads Bridge," 23:535

How James Buchanan Eads became chief engineer and why that title meant something unique in building the bridge now bearing his name.

———, (R) Ratigan, *Highways over Broad Waters*, 2:204; *The Beer Can by the Highway*, (R) 4:116; (R) Naeve, ed., *Winterthur Portfolio One*, 6:322; (R) Trachtenberg, *Brooklyn Bridge*, 7:109; (R) Condit, *The Port of New York*, 22:181

Krafft, Fritz, *Dynamische und statische Betractungsweise in der antiken Mechanik*, (R) 12:630; *see also* Schimank, Hans

Kraft für die Welt, 1864-1964: Klöckner-Humboldt-Deutz AG, G. Goldbeck, (R) 7:429

Krajewski, Kathleen M., "Scientists and Social Responsibility: University of Delaware, July 1975," 18:56

Cosponsored by the university's Science, Technology, and Society Committee and its new Values Center, the conference brought together several young philosophers of technology to present the main papers, eminent philosophers and historians to comment and discuss, and a number of practicing technologists to listen and question.

Kramer, Samuel Noah, *The Sumerians*, (R) 5:445; (R) Adams, *Land behind Baghdad*, 7:74

Kramish, Arnold, *Atomic Energy in the Soviet Union*, (R) 2:85; *The Peaceful Atom in Foreign Policy*, (R) 6:156

Krammer, Arnold, "Fueling the Third Reich," 19:394

How Germany sought to provide crude and synthetic oil for war.

———, "Technology Transfer as War Booty: The U.S. Technical Oil Mission in Europe, 1945," 22:68
American efforts to obtain the techniques of German synthetic fuel production succeeded, but the data went largely unused.

———, (R) Mehrtens and Richter, eds., *Naturwissenschaft, Technik und NS-Ideologie*, 22:825

Kranakis, Eda Fowlks, "The French Connection: Giffard's Injector and the Nature of Heat," 22:3
Important not only as a technical innovation, Henri Giffard's injector of 1858 forced engineers to rethink their steam engine theory and promoted the movement toward academic training; awarded the 1985 Abbott Payson Usher Prize.

Krantz, Frederick; *see* Hohenberg, Paul M.

Kranzberg, Melvin, "At the Start," 1:1
Statement of purpose for SHOT and for *T&C*.

———, "Charles Singer and *A History of Technolgy*," 1:299
Introduction to an issue of the journal devoted to reviews of the five-volume work that Singer initiated and directed.

———, "The Technical Act: Commentary," 3:519
Comments on White (3:486) and Hall (3:501).

———, "Toward a Philosophy of Technology: Prefatory Note," 7:301
Opening an issue of *T&C* devoted to this topic.

———, "The Cultural Uses of Science and Technology," 15:460
Summary of a session at SHOT's 1973 San Francisco meeting with papers by Arnold Thackray on science in the Industrial Revolution, Brooke Hindle on technological perceptions in antebellum America, Thomas Hughes on engineers and nazi ideology, and comments by Everett Mendelsohn.

———, [SHOT Bicentennial Meeting IV,] 17:503
Summary of the fourth formal session at SHOT's 1975 Washington Bicentennial meeting with papers by Carroll Pursell on technology and government in the depression, John Burke on advertising and pollution, and comments by George Basalla.

———, "Passing the Baton," 22:695
The retiring editor reviews *T&C*'s history.

———, "Let's Not Get Wrought Up about It," 25:735
Comment on Staudenmaier, 25:707.

———, (R) Romaine, *A Guide to American Trade Catalogs*, 2:282; (R) Mantoux, *The Industrial Revolution in the Eighteenth Century*, 5:81; *see also* Kelly, Patrick

———, ed., *Ethics in an Age of Pervasive Technology*, (R) 22:829

Kranzberg, Melvin, and William H. Davenport, eds., *Technology and Culture*, (R) 14:474

Kranzberg, Melvin, and Joseph Gies, *By the Sweat of Thy Brow*, (R) 17:170

Kranzberg, Melvin, and Timothy Hall, with Jane L. Scheiber, eds., *Energy and the Way We Live*, (R) 22:658

Kranzberg, Melvin, and Carroll W. Pursell, Jr., eds., *Technology in Western Civilization*, (R) 9:468

Krätz, O., and Claus Priesner, (R) Multhauf, *Neptune's Gift*, 21:648

Kraus, Henry, *Gold Was the Mortar*, (R) 21:85

Kraus, Jerome, "The British Electron-Tube and Semiconductor Industry, 1935–1962," 9:544
Protectionism marked the industry before and technical advance during World War II, with postwar technical decline coupled to rising exports and cross-national financial integration of firms.

Krause, Elliott A., (R) Elliott, *The Sociology of the Professions*, 15:524; (R) MacKenzie, *The Aristocracy of Labor*, 16:114; (R) Helmer, *The Deadly Simple Mechanics of Society*, 17:586; (R) Illich, *Medical Nemesis*, 18:725

Kravchenko, G. S., *Ekonomika SSSR v gody Velikoi Otchestvennoi voiny*, (R) 15:122

Kren, Claudia, "The Traveler's Dial in the Late Middle Ages: The Chilinder," 18:419
Description of a portable sundial known from Vitruvius and used in the Middle Ages.

———, (R) Woodcroft, trans., *The "Pneumatics" of Hero of Alexandria*, 15:326; (R) Shirley, ed., *Thomas Harriot*, 17:791

Kretzmann, Edwin M., Jr., (R) Skolnikoff, *Science, Technology, and American Foreign Policy*, 8:517

Kreutz, Barbara M., "Mediterranean Contributions to the Medieval Mariner's Compass," 14:367
Despite earlier Chinese references to

magnetized direction finders, the compass proper seems a late-medieval Mediterranean invention.

Krinsky, Carol Herselle, *Rockefeller Center*, (R) 20:207

Krohn, Roger G., *The Shaping of Science*, (R) 12:671

Kroker, Werner, ed., *Second International Congress on the Conservation of Industrial Monuments*, (R) 23:238

Krysko, Vladimir W., *Lead in History and Art*, (R) 23:665

Kuehn, Thomas J., and Alan L. Porter, eds., *Science, Technology, and National Policy*, (R) 23:488

Kugel, S. A.; *see* Gvishiani, D. M.

Kuhn, James W., *Scientific and Managerial Manpower in Nuclear Industry*, (R) 9:260

Kuhn, Thomas S., *The Essential Tension*, (R) 20:218

Kuhns, William, *The Post-industrial Prophets*, (R) 15:357

Kuisel, Richard F., (R) Weber, *Peasants into Frenchmen*, 19:232

Kulik, Gary, Roger Parks, and Theodore Penn, eds., *The New England Mill Village*, (R) 24:682

Kullikoff, Allan, (R) Quimby, ed., *Material Culture and the Study of American Life*, 20:366

Kultur und Technik: Zeitschrift des Deutsches Museums München, vol. 1, (R) 19:724

Kulturelle Beziehungen zwischen Nürnberg und den Deutschen im Südosten im 14. bis 16. Jahrhundert, U. M. Schwob, (R) 13:309

Die Kulturgeschichte der Schraube, R. Kellermann and W. Treue, (R) 7:76

Kulturgeschichte des technischen Zeichnens, A. Nedoluha, (R) 4:217

Kumanev, Georgii A., *Na sluzhbe fronta i tyla*, (R) 19:238

Kumar, Krishan, *Prophecy and Progress*, (R) 20:848

Kunik, I. Jordan, "A Patent Attorney Takes Issue," 1:221
Challenging both methods and findings of Gilfillan, 1:201; cf. Gilfillan, 1:227

Kunkel, Edward J., *Pharaoh's Pump*, (R) 4:56

Die Kunst des Metalldrehens bei den Römern, A. Mutz, (R) 14:488

Kunstuhrmacher in Alt-Augsburg, M. Bobinger, (R) 12:490

Kurland, Norman D., (R) Pyke, *Slaves Unaware?* 2:202; (R) Kaplan, *Leisure in America*, 2:431; (R) de Grazia, *Of Time, Work, and Leisure*, 4:370

Kurylo, Friedrich, and Charles Süsskind, *Ferdinand Braun*, (R) 25:116

Kurze Geschichte der Technik, F. Klemm, (R) 4:52

Kurzweil, Edith, (R) Turner, *Exploring the Industrial Subculture*, 14:672

Kushlin, V. I.; *see* Lebedev, V. G.

Kuuse, Jan, *Interaction between Agriculture and Industry*, (R) 17:761

Kuzin, A. A., *K. Marks i problemy tekhniki*, (R) 11:326

Kuznets, Simon, *Modern Economic Growth*, (R) 8:419

Kyeser, Conrad, aus Eichstätt, *Bellifortis*, G. Quarg, ed., (R) 10:436

"Kyeser's *Bellifortis*: The First Technological Treatise of the Fifteenth Century," L. White, jr., 10:436

Kyle, John H., *The Building of TVA*, (R) 1:189

Kyropoulos, Peter, (R) *Automobile Quarterly*, 5:97

Kytle, Elizabeth, *Home on the Canal*, (R) 25:658

La Force, James Clayburn, "Technological Diffusion in the 18th Century: The Spanish Textile Industry," 5:322
Royal sponsorship of foreign experts won Spanish access to the latest textile technology, but the main goal, building an industry, required more than technology and was only partly achieved.

———, *The Development of the Spanish Textile Industry*, (R) 7:528

Labor and Development in Latin America, J. R. Ramos, (R) 12:679

Labor in a Changing Economy, W. Haber, ed., (R) 10:623

Labyrinths of Iron: A History of the World's Subways, B. Bobrick, (R) 24:288

Lach, Donald F., *Asia in the Making of Europe*, (R) 20:622

Lachman, Roy; *see* Kasschau, Richard A.

"Ladislao Reti (1901–1973)," B. Dibner, 15:440

"Ladislao Reti and *The Unknown Leonardo*," K. T. Steinetz, 17:264

Ladrière, Jean, *The Challenge Presented to Cultures by Science and Technology*, (R) 21:710

Ladurie, Emmanuel LeRoy, *The Territory of the Historian*, (R) 21:237

LaFeber, Walter, *The New Empire*, (R) 6:657

Lafleur, P., (R) Manners, *The Changing World Market for Iron Ore*, 13:650

Lahue, Kalton C., and Joseph A. Bailey, *Glass, Brass and Chrome*, (R) 18:231

Lakiev, Aleksandr Borisovich, *A Russian Looks at America*, A. Schrier and J. Story, eds., (R) 22:168
Lakoff, Sanford A., (R) Armytage, *Yesterday's Tomorrows*, 11:124
The Lambent Flame, J. D. Keating, (R) 17:149
Lamberg-Karlovsky, C. C., (R) Franklin et al., eds., *The Search for Ancient Tin*, 21:474
Lambert, J. M.; *see* Goodman, Gordon T.
Lamberton, Donald M., (R) Sporn, *Technology, Engineering, and Economics*, 12:143; (R) Diebold, *Business Decisions and Technological Change*, 12:528
Lamont, Lansing, *Day of Trinity*, (R) 7:520
Lampert, Nicholas, *The Technical Intelligentsia and the Soviet State*, (R) 22:203
Lampman, L. R., (R) Thornton, *British Shipping*, 2:73
Lancashire in Decline: A Study in Entrepreneurship, Technology, and International Trade, L. G. Sandberg, (R) 17:158
Lancashire Textiles—a Case Study of Industrial Change, C. Miles, (R) 10:461
The Lancashire Watch Company, 1889–1910, A. Smith and H. G. Abbott, (R) 15:505
Land and Water Use, W. Thorne, ed., (R) 6:496
Land behind Baghdad: A History of Settlement on the Diyala Plains, R. McC. Adams, (R) 7:74
Land into Water—Water into Land: A History of Water Management in Florida, N. M. Blake, (R) 25:160
The Land of Stevin and Huygens: A Sketch of Science and Technology in the Dutch Republic during the Golden Century, D. J. Struik, (R) 24:263
Land of the Underground Rain: Irrigation on the Texas High Plains, 1910–1970, D. E. Green, (R) 15:339
The Land Question and European Society, F. E. Huggett, (R) 17:370
Land That Our Fathers Plowed: The Settlement of Our Country as Told by the Pioneers Themselves and Their Contemporaries, D. G. Greenberg, ed., (R) 11:303
Land Use Policy and Problems in the United States, H. Ottoson, ed., (R) 6:140
Landels, J. G., *Engineering in the Ancient World*, (R) 19:728
Landman, David; *see* Fairchild, Johnson E.
"Landmarks in U.S. Naval Technology," D. S. Fahrney, 5:284
Landsberg, Hans H., *Natural Resources for U.S. Growth*, (R) 6:499
Lane, David, and George Kolankiewicz, eds., *Social Groups in Polish Society*, (R) 15:349
Lane, Michael R., *The Story of the Steam Plough Works*, (R) 22:618
Lang, A. Scheffer, and Richard M. Soberman, *Urban Rail Transit*, (R) 12:519
Langan, Thomas, (R) Todd, *History as Applied Science*, 14:525
Langdon, George D., Jr., (R) Rutman, *Husbandmen of Plymouth*, 9:605
Langenbach, Randolph; *see* Hareven, Tamara K.
Langenbruch, Theodor, (R) Kapp, *Grundlinien einer Philosophie der Technik*, 21:276
Langley, Harold D., (R) Creighton, *Dogwatch and Liberty Days*, 25:867; (R) Watt et al., eds., *Starving Sailors*, 25:867
Langley, Kathleen M., *The Industrialization of Iraq*, (R) 3:369
"The *Lanifricarius* and the *Officinae Lanifricariae* at Pompeii," W. O. Moeller, 7:493
Lankton, Larry D., "Something Old, Something New: The Reexhibition of the Henry Ford Museum's Hall of Technology," 21:594
Why the Ford Museum in Dearborn, Michigan, remains disappointing despite its extraordinary wealth of artifacts.
———, "The Machine *under* the Garden: Rock Drills Arrive at the Lake Superior Copper Mines, 1868–1883," 24:1
Transferring power rock-drilling technology from tunneling to mining proved surprisingly difficult, and its success produced little further mechanization for decades.
———, (R) Society for Industrial Archaeology, *IA*, 24:516; (R) Kulik et al., eds., *The New England Mill Village*, 24:682
Lankton, Larry D., and Charles K. Hyde, *Old Reliable*, (R) 25:163
Lansdell, Norman, *The Atom and the Energy Revolution*, (R) 2:83
Larre, C.; *see* Gardet, L.
Larson, Henrietta M., Evelyn H. Knowlton, and Charles S. Popple, *History of Standard Oil Company (New Jersey), 1927–1950*, (R) 14:660
Larson, John W., *Those Army Engineers*, (R) 23:126
Larson, R.; *see* Porter, Alan
Lasansky, Jeanette, *To Draw, Upset, and Weld*, (R) 23:497
Lasby, Clarence G., (R) McGovern, *Crossbow and Overcast*, 7:561; (R) Irving, *The Mare's Nest*, 8:429; *Project Paperclip*, (R) 14:659
Lass, William E., *A History of Steamboating on the Upper Missouri River*, (R) 5:613

The Last Chance Energy Book, O. Phillips, (R) 22:217

Laszlo, Ervin, ed., *The Relevance of General Systems Theory*, (R) 14:674; *A Strategy for the Future*, (R) 16:699

The Latin American Tradition, C. Wagley, (R) 9:633

Latrobe, Benjamin Henry, *The Virginia Journals of Benjamin Henry Latrobe*, E. T. Carter and A. Polites, eds., (R) 20:226; *The Engineering Drawings of Benjamin Henry Latrobe*, D. H. Stapleton, ed., (R) 22:794

Lattin, Harriett Pratt, *Star Performance*, (R) 11:449

Lauda, Donald P.; *see* Pytlik, Edward C.

Laudan, Larry, *Progress and Its Problems*, (R) 19:791

Laudan, Rachel, "Models of Scientific and Technological Change: Center for Philosophy of Science, University of Pittsburgh, April 9–12, 1981," 23:78

A week-end workshop brought together a small number of historians, philosophers, and sociologists to discuss the nature of technological knowledge and how it changes.

Laughery, Kenneth R.; *see* Kasschau, Richard A.

Laux, James M.; *see* Bardou, Jean-Pierre

Lavallée, Omer, (R) Robertson, *The Origins of the Scottish Railway System*, 25:653

Laver, Murray, *Computers and Social Change*, (R) 22:354

Lavington, Simon H., *Early British Computers*, (R) 22:644

Lavoisier—the Crucial Year: The Background and Origin of His First Experiments on Combustion in 1772, H. Guerlac, (R) 4:73

Law, R. J., *James Watt and the Separate Condenser*, (R) 11:627; (R) Robinson and McKie, eds., *Partners in Science*, 12:96

Lawless, Edward B., *Technology and Social Shock*, (R) 19:796

Lawrence, Christopher, (R) Davis, *Medicine and Its Technology*, 24:543

Lawrence, Paul R.; *see* Turner, Arthur N.

"The Laws of Technological Development," A. Zvorikine, 3:443

Layton, David, *Science for the People*, (R) 16:114

Layton, Edwin T., Jr., "The Interaction of Technology and Society," 11:27

Technological determinism has largely vanished as an issue, replaced by the concept of technology as independent variable.

———, "Mirror-Image Twins: The Communities of Science and Technology in 19th-Century America," 12:562

The engineering sciences, particularly strength of materials, exemplify both the links between, and the divergence of, two communities which assign opposed values to common interests.

———, "Topics in the History of Technology," 13:440

Notes on a session at SHOT's 1971 New York meeting with papers by Walter Gross on Porter's steam-engine governor, Michael Massouh on Tom L. Johnson's cable system, John Beer on Russian iron technology in America, Bert Hall on the anonymous engineer of the Hussite Wars, Paul Clark on Millikin in the Rice-Webster gun controversy, Roger Bilstein on 1920s aeronautics, and Herbert Kissling on Arnold Engineering Development Center.

———, "Technology as Knowledge," 15:31

Technology encompasses knowledge as well as technique, but knowledge of a kind distinct from scientific knowledge.

———, "Innovations and Their Impact," 15:456

Summary of a session at SHOT's 1973 San Francisco meeting with papers by Otto Mayr on seventeenth-century ideas of a clockwork universe, Monte Calvert on the U.S. manufactured gas industry, Allan Comp on the Utah Sugar Company, Lucius Ellsworth on U.S. inorganic tanning, Bernard Finn on the U.S. Pacific telegraph cable, Jean Christie on Morris Cooke, and Roger Bilstein on Saturn rocket management.

———, "American Ideologies of Science and Engineering," 17:688

Pure science, engineering science, and design exemplify three historically distinct types of relationship between science and technology.

———, "Scientific Technology, 1845–1900: The Hydraulic Turbine and the Origins of American Industrial Research," 20:64

Uriah A. Boyden and James B. Francis developed design principles and experimental procedures for an empirical science geared to the needs of technology.

———, "Engineers and Political Economy in Twentieth-Century America," 23:466

Summary of a session at SHOT's 1981 Milwaukee meeting with papers by Bernard Carlson on the MIT-GE cooperative engineering course, Bruce Seely on highway engineering, and Michal McMahon on radio engineers and popular broadcasting.

———, (R) Armytage, *The Rise of the Technocrats*, 7:532; (R) Gould, *The Technical Elite*, 8:240; (R) Elsner, *The Technocrats*, 9:256; (R) Qualey, ed., *Thorstein Veblen*, 10:616; (R) Pursell, ed., *Readings in Technology and American Life*, 11:104; (R) Pursell, *Early Stationary Steam Engines in America*, 12:99; (R) Merritt, *Engineering in American Society*, 12:120; (R) Kakar, *Frederick Taylor*, 12:666; *The Revolt of the Engineers*, (R) 13:100; (R) Thackray and Mendelsohn, eds., *Science and Values*, 16:651; (R) Morison, *From Know-How to Nowhere*, 17:746; (R) Mayr, ed., *Philosophers and Machines*, 18:89; (R) Reingold, ed., *Science in America since 1820*, 18:98; (R) Fleming and Bailyn, eds., *Perspectives in American History*, 18:532

———, ed., *Technology and Social Change in America*, (R) 6:110

Lazare Carnot, Savant: A Monograph Treating Carnot's Scientific Work . . . , C. C. Gillispie, (R) 14:624

Lazerson, Marvin, and W. Norton Grubb, eds., *American Education and Vocationalism*, (R) 16:113

Le Corbeiller, Jean, (R) Pyke, *The Science Myth*, 4:214; (R) Leavis, *Two Cultures?* 5:119; (R) Aron, ed., *World Technology and Human Destiny*, 6:144; (R) Coutts-Smith, *The Dream of Icarus*, 12:378; (R) Franke, *Computer Graphics/Computer Art*, 13:660; (R) Huggins and Entwisle, *Iconic Communication*, 16:126

Le Goff, Jacques, *Time, Work, and Culture in the Middle Ages*, (R) 24:118

Lead in History and Art/Blei in Geschichte und Kunst, V. W. Krysko, (R) 23:665

The Lead Smelting Mills of the Yorkshire Dales, R. Clough, (R) 4:219

The Leadership of the Reclamation Movement, 1875–1902, S. S. Davison, (R) 24:713

Lear, F. S.; *see* Drew, K. F.

Leary, William M., Jr., *The Dragon's Wings*, (R) 18:120

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Leavitt, Judith Walzer, *The Healthiest City*, (R) 24:542

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Leavitt, Thomas W., "Industrial Archaeology in Lawrence, Massachusetts," 7:201

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———, "The Merrimack Valley Textile Museum," 8:204

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———, "Toward a Standard of Excellence: The Nature and Purpose of Exhibit Reviews," 9:70

Introduction to a new *T&C* section, critical reviews of museum exhibits.

———, "Five Years of *Industrial Archaeology*," 10:587

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———, (R) Bythell, *The Handloom Weavers*, 11:441; (R) Ponting and Chapman, eds., *Textile History*, vol. 6, 17:603; (R) vol. 9, 20:799

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Lebedev, V. G., and V. I. Kushlin, eds., *Nauchno-tekhnicheskai revoliutsiia i preimustichestva sotsializma*, (R) 18:576

Lebergott, Stanley, *Manpower in Economic Growth*, (R) 6:282

LeBlanc, Steven A.; *see* Satson, Patty Jo

Lechtman, Heather, "Andean Value Systems and the Development of Prehistoric Metallurgy," 25:1

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Lechtman, Heather, and Robert S. Merrill, eds., *Material Culture*, (R) 23:110

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Lee, Antoinette, *A Biographical Dictionary of American Civil Engineers*, (R) 14:108

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linguistic phenomena, science as humanistic subject, and the role of technology in linking aesthetic and scientific activities.

Lee, Lawrence B., *The Appreciation of Stained Glass,* (R) 19:536; *Reclaiming the American West,* (R) 24:713

Lee, Ronald A., *The Knibb Family,* (R) 5:608

Leek, Michael E., "The S.S. *Great Britain,*" 19:199
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Leene, Jentina E. *Textile Conservation,* (R) 15:363

Leeson, R., *Travelling Brothers,* (R) 22:621

The Legacy of China, R. Dawson, ed., (R) 6:298

Legacy of Flight: The Guggenheim Contribution to American Aviation, R. P. Hallion, (R) 19:572

The Legacy of Hiroshima, E. Teller, (R) 3:359

Legacy of Wings: The Harold F. Pitcairn Story, F. K. Smith, (R) 24:705

Legal Aspects of Technology Utilization, R. E. Miller, (R) 16:702

"The Legend of Eli Whitney and Interchangeable Parts," R. S. Woodbury, 1:235

Lehman, Milton, *This High Man,* (R) 6:482

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Leicester, Henry M., "Chemistry, Chemical Technology, and Scientific Progress," 2:352
Scientific progress requires balance between theory and practice.

———, (R) Partington, *History of Greek Fire and Gunpowder,* 2:272; (R) Levey, *Mediaeval Arabic Bookmaking and Its Relation to Early Chemistry and Pharmacology,* 4:343; (R) *One Hundred Years of Pharmacy in Canada,* 11:321; (R) Blake, ed., *Safeguarding the Public,* 12:515

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Breeding and using mules has assumed the form of technological development since antiquity.

———, "Secret Communication among the Greeks and Romans," 10:139
On techniques of restricting information flow.

———, *Transportation and Communication in Early Medieval Europe,* (R) 15:481

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Leistritz, Larry; *see* Murdock, Steve H.

Leisure in America: A Social Inquiry, M. Kaplan, (R) 2:431

Leitbilder der Technik: Biblische Tradition und technischer Fortschritt, A. Stöcklein, (R) 12:495

Leitenberg, Milton, (R) Albertson and Barnett, eds., *Environment and Society in Transition,* 14:345

Leiter, Alfred, and Alma Helfrich-Dörner, *Die Urh, Zeitmesser und Schmuck in fünf Jahrhunderten,* (R) 12:490

Leland, Mrs. Wilfred C., with Minnie Dubbs Millbrook, *Master of Precision,* (R) 8:503

LeMahieu, D. L., "*The Gramophone*: Recorded Music and the Cultivated Mind in Britain between the Wars," 23:372
An amateur magazine championed classical music recording against the recognized commercial demand for popular music.

Lemonnier, Pierre, *Les Salines de l'ouest,* (R) 24:115

Lenzen, Victor F., *Benjamin Peirce and the U.S. Coast Survey,* (R) 10:452

Lenzi, Giulio, "*Storia della tecnica dal Medioevo al Renascimento,* by Umberto Forti," 1:419
Description of a multivolume Italian work on medieval and renaissance technology.

Leon Battista Alberti: Universal Man of the Renaissance, J. Gadol, (R) 12:632

Leon Trotsky and the Politics of Economic Isolation, R. B. Day, (R) 15:652

Leonard, David K., *Reaching the Peasant Farmer,* (R) 19:547

"Leonardo and Ramelli," L. Reti, 13:577

"Leonardo as Scientist and as Technologist: Florence-Vinci, Italy, June 1969," M. L. R. Bonelli, 12:52

Leonardo da Vinci, *The Sublimations . . . with a Translation of the Codex Trivulzianus,* R. S. Stites, trans., (R) 13:301

Leonardo da Vinci: The Royal Palace at Romorantin, C. Pedretti, (R) 15:634

"The Leonardo da Vinci Codices in the Biblioteca Nacional of Madrid," L. Reti, 8:437

"The Leonardo da Vinci Medal," 4:257; 5:280; 6:324; 7:206; 8:310; 9:328;

10:191; 11:205; 12:235; 13:434; 14:423; 15:447; 16:424; 17:493; 18:471; 19:465; 20:583; 21:437; 22:563; 23:443; 25:608
SHOT's annual award for outstanding contributions to the history of technology first went to R. J. Forbes in 1962; subsequent medals have gone to Abbott Payson Usher (1963), Lynn White, jr. (1964), Maurice Daumas (1965), Cyril Stanley Smith (1966), Melvin Kranzberg (1967), Joseph Needham (1968), Lewis Mumford (1969), Bertrand Gille (1970), A. G. Drachmann (1971), Ladislao Reti (1972), Carl W. Condit (1973), Bern Dibner (1974), Friedrich Klemm (1975), Derek J. de Solla Price (1976), Eugene S. Ferguson (1977), Torsten Althin (1978), John U. Nef (1979), John B. Rae (1980), Donald S. L. Cardwell (1981), and Louis C. Hunter (1983).

"Leonardo, the Wheel Lock, and the Milling Process," V. Foley et al., 24:399

Lerche, Grith; *see* Steensberg, Axel

Lerche, Grith, and Axel Steensberg, *Agricultural Tools and Field Shapes*, (R) 23:244

Lerna, a Preclassical Site in the Argolid: Results of Excavations Conducted by the American School of Classical Studies, Vol. 2, *The People*, J. L. Angel, (R) 14:78

Lerner, Abba, and Hiam Ben-Shahar, *The Economics of Efficiency and Growth*, (R) 17:183

Leser, Paul, (R) Murdock, *Africa*, 1:256

Lesley, Robert W., *History of the Portland Cement Industry in the United States*, (R) 16:500

Leslie, Stuart W. "Charles F. Kettering and the Copper-cooled Engine," 20:752
The failure of GM's 1923 air-cooled engine illustrates the gap between design and production, which may reflect institutional no less than technical problems; awarded 1980 Abbott Payson Usher Prize.

———, "The Urban Habitat: The City and Beyond," 23:417
Review of an exhibit at the Milwaukee Public Museum.

———, "SHOT Silver Anniversary Session," 25:615
Summary of a session at SHOT's 1983 Washington meeting with a paper by John Staudenmaier on the society's achievements and responses by John Rae and Melvin Kranzberg.

Less is More: The Art of Voluntary Poverty, G. VandenBroeck, ed., (R) 21:701

Lessons from Japanese Development: An Analytical Economic History, A. C. Kelley and J. G. Williamson, (R) 17:559

"Let's Be Sure Technology Is for Man," J. G. Burke, 10:11

"Let's Not Get Wrought Up about It," M. Kranzberg, 25:735

Leuba, Clarence J., *A Road to Creativity*, (R) 13:645

"Leupold's *Theatrum machinarum*: A Need and an Opportunity," E. S. Ferguson, 12:64

"Levels and Levelers: Surveying Irrigation Canals in Medieval Valencia," T. F. Glick, 9:165

Levere, T. H.; *see* Turner, G. L.

Levey, Martin, (R) Forbes, *Studies in Early Petroleum History* and *More Studies in Early Petroleum History*, 2:55; *Mediaeval Arabic Bookmaking and Its Relations to Early Chemistry and Pharmacology*, (R) 4:343

Levey, Martin, and Denis I. Duveen, "Chemical Technology," 1:371
Review of the subject's treatment in the five volumes of Singer's *History of Technology*.

Lévi-Strauss, Claude, *The Raw and the Cooked*, (R) 11:613

Levine, Adeline Gordon, *Love Canal*, (R) 25:669

Levine, Arnold S., (R) Layton, *Science for the People*, 16:119

Levine, Mortimer, *Tudor England*, (R) 10:352

Levinson, Mark, (R) Hofmann, *Classical Mathematics*, 2:86

Levinson, Paul, (R) Curtis, *Culture as Polyphony*, 20:835

———, ed., *In Pursuit of Truth*, (R) 25:694

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Lewicki, Tadeusz, with Marion Johnson, *West African Food in the Middle Ages*, (R) 16:627

Lewis, Arthur, *The Evolution of the International Economic Order*, (R) 20:225

Lewis, David L., ed., *The Automobile and American Culture*, (R) 23:505

Lewis, Gene D., *Charles Ellet, Jr.*, (R) 11:446

Lewis, John Wilson, ed., *The City in Communist China*, (R) 14:95

Lewis, M. J. T., (R) Raistrick, *Industrial Archaeology*, 14:616

Lewis, Robert, *Science and Industrialisation in the USSR*, (R) 24:137

Lewis, Sean Day, *Bulleid,* (R) 6:457

Lewis, W. David, "Technology and Urbanization: The SHOT-OAH Program, April 1966," 8:67

A SHOT session at the OAH meeting in Cincinnati included papers by Roy Lubove on the common failure of urban historians to treat technology adequately, Sam Bass Warner on transportation and cities, Carl Condit on the technological shaping of specialized port-railroad cities, and comments by Carl Degler and Charles Glaab.

———, "Corning Museum of Glass," 10:68

A review of the museum's exhibits, questioning the stress on aesthetics rather than technique; cf. Perrot, 10:174.

———, "Parrying Perrot," 10:178

Response to Perrot's rebuttal, 10:174.

———, "The History of Science and the History of Technology in the Undergraduate Curriculum," 15:453

Summary of a session at SHOT's 1973 San Francisco meeting with papers by Harold Sharlin on antiscientism, John Beer on what undergraduates want versus what they need, and comments by Michael Mahoney and Merritt Smith.

———, "The Smithsonian Institution's '1876' Exhibit," 18:670

Review of an exhibit partially recreating the Philadelphia Centennial Exhibit of 1876.

———, "Works in Progress: American Technology," 24:471

Summary of a session at SHOT's 1982 Philadelphia meeting with papers by Steven Usselman on Dudley and the Pennsylvania railroad, Donald Hoke on Elisha Root, Kathleen Ochs on mining education, Karen Belmore on William Stanley, Donald Jackson on California's early three-phase AC power system, Andrew Patterson on information security and weapons technology, and John Smith on Du Pont basic research.

———, (R) Hower and Orth, *Managers and Scientists,* 5:473; (R) Orth et al., *Administering Research and Development,* 6:310; (R) Cockcroft, ed., *The Organization of Research Establishments,* 7:566; (R) Kostelanetz, *Beyond Left and Right,* 11:120; (R) Ferkiss, *Technological Man,* 12:388; (R) Bateson, *Our Own Metaphor,* 15:146; (R) Binder, *Coal Age Empire,* 17:140; *Iron and Steel in America,* (R) 19:118; (R) Dorf and Hunter, eds., *Appropriate Visions,* 21:701; (R) Vanden-Broeck, ed., *Less is More,* 21:701; (R) Hassinger, *Henderson Steel,* 23:498; (R) Constant, *The Origins of the Turbojet Revolution,* 23:512; *see also* Channell, David F.; *see also* Gilchrist, David T.

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Liber tertius de ingeneis ac edifitiis non usitatis, M. Taccola, (R) 16:466

" 'Liberalizers' versus 'Scientific Men' in the Antebellum Patent Office," R. C. Post, 17:24

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"The Library of the DeGolyer Foundation," E. DeGolyer, Jr., 5:408

"The Library of the Institution of Electrical Engineers in London," J. E. Wright, 9:191

Licht, Walter, *Working for the Railroad,* (R) 25:865

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Lide, David R., Jr., (R) Rossini, *Fundamental Measures and Constants for Science and Technology,* 17:122

Liebenau, Jonathan, (R) Williams, *A History of the British Gas Industry,* 24:134

Lieberstein, Samuel, "Technology, Work, and Sociology in the USSR: The NOT Movement," 16:48

The Soviet version of rationalized production since 1921 became the context for development of industrial sociology.

———, (R) Sutton, *Western Technology and Soviet Economic Development,* 14:92; (R) Gudozhnik, *Nauchno-tekhnicheskii progress,*

14:323; (R) McKay, *Pioneers for Profit*, 14:647; (R) Milsom, *Russian Tanks*, 14:649; (R) Conyngham, *Industrial Management in the Soviet Union*, 15:121; (R) *Sovetskaia ekonomika v period Velikoi Otechestvennoi voiny 1941–1945 gg.*, 15:122; (R) Kravchenko, *Ekonomika SSSR v gody Velikoi Otechestvennoi voiny*, 15:122; (R) Goldman, *The Spoils of Progress*, 15:125; (R) Bernard and Pelto, eds., *Technology and Social Change*, 15:144; (R) *Sovemennaia nauchno-tekhnicheskaia revoliutsiia*, 15:354; (R) Sutton, *Western Technology and Soviet Economic Development*, 15:508; (R) Driakhlov et al., eds., *Nauchno-tekhnicheskaia revoliutsiia i obshchestvo*, 16:329; (R) Efremtsev, *Istoriia Kolomenskogo zavoda*, 16:643; (R) Riedel, *Eisen und Kohle für das* Dritte Reich, 16:649; (R) Mogilev, ed., *Chelovek-nauka-tekhnika*, 16:691; (R) Sidorov, *Ekonomicheskoe polozhenie Rossii v gody pervoi mirovoi voiny*, 17:390; (R) Ludwig, *Technik und Ingenieure im Dritten Reich*, 17:392; (R) Miliutin, *Sotsgorod*, 17:808; (R) Afanasyer, *The Scientific and Technological Revolution*, 18:259; (R) Gatovskii, *Nauchno-tekhnicheskii progress i ekonomika razvitogo sotsializma*, 18:261; (R) Lebedev and Kushlin, eds., *Nauchno-tekhnicheskai revoliutsiia i preimushchestva sotsializma*, 18:576; (R) Berliner, *The Innovation Decision in Soviet Industry*, 18:733; (R) Kumanev, *Na sluzhbe fronta i tyla*, 19:238; (R) Gromeka, *SShA*, 19:771; (R) Amann et al., eds., *The Technological Level of Soviet Industry*, 19:772; (R) Kim, *Sotsial'no- ekonomicheskie problemy istorii razvitogo sotsializma v SSSR*, 20:248; (R) Lampert, *The Technical Intelligentsia and the Soviet State*, 22:203; (R) Bailes, *Technology and Society under Lenin and Stalin*, 22:823

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With terms suitably defined, quantitative analysis shows a sharp rise in technological improvements after 1830; cf. "Erratum," 21:159.

The Life and Decline of the American Railroad, J. F. Stover, (R) 12:109

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Lindgren, Michael, and Svante Lindqvist, "Scheutz's First Difference Engine Rediscovered," 23:207

Description of the 1843 machine devised by Georg and Edvard Scheutz, long thought lost but rediscovered in 1979.

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McGill, William A., ed., *The Ohio Canals,* F. N. Wilcox, (R) 12:107

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———, "Workshop on the Interrelations between Science and Technology, and Ethics and Values: Reston, Virginia, April 10–12, 1975," 17:249

The AAAS-sponsored workshop included keynote addresses on the need for interdisciplinary approaches, dis-

tinctions between ethics and values, distinctions between science and technology, and biomedical ethics; and case studies of a nuclear power plant, the value fit between science students and practitioners, an abortion trial, and energy use.

———, "Stokowski and the Bell Telephone Laboratories: Collaboration in the Development of High-Fidelity Sound Reproduction," 24:38
During the 1930s, noted conductor Leopold Stokowski's work with Bell Labs scientists and engineers had important consequences for the technology of sound reproduction.

McGovern, James, *Crossbow and Overcast*, (R) 7:561

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———, "Science and Engineering in the History of Aviation," 2:391

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———, "Commentary," 4:174

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———, "Herbert Clark Hoover (1874–1964)," 6:108

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———, "Government, Industry, and Technology: The SHOT-OAH Program, April 1968," 9:576

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———, "Topics in the History of Technology," 14:429

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———, "Engineers are People," 16:404

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———, [SHOT Bicentennial Meeting II,] 17:500
Summary of the second formal session at SHOT's 1975 Washington Bicentennial meeting with papers by Carl Condit on urban technology, Edwin Layton on the hydraulic turbine and industrial research, and comments by Reese Jenkins.
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———, "Robert S. Woodbury (1907–1983)," 25:911
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Shelby, Lonnie R., "Medieval Masons' Tools: The Level and the Plumb Rule," 2:127
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Throughout their long history, skillful use of these key tools meant more to good building than did sophisticated design.

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The historical evidence is feeble, the scientific basis at best ambiguous, the military rationale nonexistent.
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"The Sinking of the *Ma Robert*: An Excursion into Mid-19th-Century Steelmaking," J. G. Parr, 13:209

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Built in 1875–76, the incline was a desparate and failed attempt by the Chesapeake and Ohio Canal Company to compete against the railroad.

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Analysis suggests mail made from slit rather than drawn wire, with techniques showing no consistent improvement over time.

———, "Reply to Mr. Martin Burgess on Mail-making Methods," 1:289
Response to criticism by Burgess, 1:289.

———, "The Interaction of Science and Practice in the History of Metallurgy," 2:357
Metallurgical practice has almost always preceded scientific knowledge, though science has closed the gap since the nineteenth century.

———, "The Discovery of Carbon in Steel," 5:149
Developments during the preceding century led about 1800 to recognizing carbon's role in iron technology.

———, "Granulating Iron in Filarete's Smelter," 5:386
Substantial additions and corrections to Spencer, 4:201.

———, " 'The Glazier' by Jost Amman," 6:110
The Swiss illustrator (1539–91) depicted various arts, crafts, and trades in a series of woodcuts published in 1568.

———, "A Jeweler's Shop (1533)," 8:207
On the *Bergwerck und Probierbüchlein* (1553), its tradition and contents.

———, "Art, Technology, and Science: Notes on Their Historical Interaction," 11:493
Each may be better understood historically by recognizing their normal interdependence, distinctions between them largely being very recent; awarded 1972 Abbott Payson Usher Prize.

———, "Architectural Shapes of Hot-rolled Iron, 1753," 13:59
How the demands of decorative art affected technical change.

———, "Theodore Allen Wertime (1919–1982)," 25:907
Memorial to a leading scholar in the history of metals.

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The American system owed more to cooperative modification than heroic invention.

———, "Toward a Standard of Excellence: The Second Installment," 15:76

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———, "The American Precision Museum," 15:413

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———, "Hall's Rifle Patent 'Number,' " 15:540

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———, "Ecce Homo—the Man and the Myth," 21:454

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———, (R) Roberts, *The Contributions of Joseph Ives to Connecticut Clock Technology,* 13:91; (R) Daniels, *Science in American Society,* 13:666; (R) Layton, ed., *Technology and Social Change in America,* 16:110; (R) Wittlin, *Museums,* 18:148; *Harpers Ferry Armory and the New Technology,* (R) 19:119; (R) Cutcliffe et al., eds., *Technology and Values in American Civilization,* 24:119; (R) Rink, *Technical Americana,* 24:119; (R) Ezell, *Handguns of the World,* 25:887

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What a fifteenth-century painting and a nineteenth-century drawing based on it reveal about the biggest dam the Romans built.

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By learning how to control weight, American builders achieved unmatched payloads in long-range aircraft during the 1930s.

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of invention, development, and innovation, stages far more distinct in economic theory than the real world.

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"The Smithsonian Institution's '1876' Exhibit," W. D. Lewis, 18:670

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A Social and Economic History of the Near East in the Middle Ages, E. Ashtor, (R) 18:522

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Social Change and Scientific Organisation: The Royal Institution, 1799–1844, M. Berman, (R) 20:211

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"Society for Industrial Archeology: Twelfth Annual Conference, Minneapolis—St. Paul, May 12–15, 1983," R. M. Frame III, 25:639
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"Society for the Study of Philosophy and Technology: Chicago, April 1977," E. Byrne, 19:100
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Sociological Perspectives of Domestic Development, G. M. Beal et al., eds., (R) 13:644
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"The Solar Cooker," E. B. Kapstein, 22:112
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———, "Transfer of Technology and Developing Countries: Belgrade, September 9–11, 1975," 17:518
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———, (R) Lerner and Ben-Shahar, *The Economics of Efficiency and Growth,* 17:183; (R) Spaey, *Science for Development,* 17:566; (R) Moravicsik, *Science Development,* 17:566; *Across the High Technology Threshold,* (R) 23:274
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Spence, Clark C., "Early Uses of Electricity in American Agriculture," 3:142
From the 1830s to the 1920s varied attempts to use electricity—for fieldwork, for stationary belt work, for illumination, for stimulating plant

growth—mostly failed for technical or economic reasons.

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Spencer, Daniel L., and Alexander Woroniak, eds., *The Transfer of Technology to Developing Countries,* (R) 9:631

Spencer, John R., "Filarete's Description of a Fifteenth Century Italian Iron Smelter at Ferriere," 4:201

In an untitled treatise on architecture apparently composed between 1461 and 1465, Antonio di Piero Averlino, called Filarete (born ca. 1400), digressed on his visit to a blast furnace, and that digression is here discussed and translated.

———, "Response: In Defense of Filarete," 5:406

Response to comments from Smith (5:386), Wertime (5:391), Needham (5:398), and Eichner (5:404).

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Spier, Robert F. G., "Primitive Technology and Art: Calgary, November 15–17, 1974," 16:603

The University of Calgary Archaeology Association's seventh annual conference stressed laboratory techniques rather than fieldwork.

———, (R) Dart, *Adventures with the Missing Link,* 1:254; (R) Redfield, *Human Nature and the Study of Society,* 5:126; (R) Hawkes and Woolley, *Prehistory and the Beginnings of Civilization,* 5:443; (R) Clark, *The Stone Age Hunters,* 9:601; (R) *Ethnologia Europaea,* 9:635; (R) Reynolds, *The Material Culture of the Peoples of the Gwembe Valley,* 10:343; *From the Hand of Man,* (R) 13:66; *Surveying and Mapping,* (R) 13:114; (R) Siegel et al., eds., *Annual Review of Anthropology,* 15:156; (R) Coles, *Archaeology by Experiment,* 16:703; (R) Hudson et al., eds., *Tomol,* 19:730; (R) Clark, *Mesolithic Prelude,* 22:779; (R) Lechtman and Merrill, eds., *Material Culture,* 23:110; (R) Lerche and Steensberg, *Agricultural Tools and Field Shapes,* 23:244

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Spong, Raymond A., "The Boyers' Locomotive Toy," 13:373

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Staff, Virgil, *D-Day on the Western Pacific,* (R) 24:524

"Stages in the Relationships between Science and Technology: Comment," C. W. Condit, 6:587

Stanback, Thomas M., Jr., and Richard V. Knight, *The Metropolitan Economy,* (R) 13:337

"Standardization and Rationalization in American Engineering," 8:322

Notes on a session chaired by John Rae at SHOT's 1966 Washington meeting with papers by Monte Calvert on ASME, John White on nineteenth-century locomotive design, and Charles Edwards on innovation costs for automobiles and railroads.

Stanley, Manfred, *The Technological Conscience,* (R) 21:144

Stapleton, Darwin H., "The American Philosophical Society Library: Holdings in Early American Technology," 23:430

Description of library holdings.

———, "American Technology Abroad," 24:484

Summary of a session at SHOT's 1982 Philadelphia meeting with papers by Liz Paley on ASME's 1889 European excursion, Wayne Lewchuk on Fordism in Britain and America, Roger Bilstein on NASA's shuttle and Europe's Spacelab, Jonathan Coppersmith on Russian-American cooperation in magnetohydrodynamics research, and comments by Bruce Sinclair.

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———, (R) Jevons, *Knowledge and Power*, 18:723; (R) Pirsig, *Zen and the Art of Motorcycle Maintenance*, 19:257; (R) Jerome, *Truck*, 19:257; (R) Theobald, *Beyond Despair*, 24:313; (R) Linhart, *The Assembly Line*, 24:502

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———, "The History of Technology and Public Policy," 24:469

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Thomas, Selma, (R) Schlereth, *Artifacts and the American Past,* 25:351

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———, (R) Sokol'skii, *Russian Solid-Fuel Rockets*, 9:621; *A History and Philosophy of Fluidmechanics*, (R) 13:498; *see also* Bramwell, A. R. S.

Tolstoy, Ivan, *James Clerk Maxwell*, (R) 25:136

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Tomayko, James E., "The Stored-Program Concept: National Computer Conference, Houston, Texas, June 9, 1982," 24:660

A panel discussed who should receive credit for the original idea.

———, (R) Ronan, *The Shorter Science and Civilization in China*, 24:547; (R) Volti, *Technology, Politics, and Society in China*, 25:681

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"Tools and the Man," L. Mumford, 1:320

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"The Tools of Empire," C. W. Pursell, Jr., 23:455

The Tools of Empire: Technology and European Imperialism in the Nineteenth Century, D. R. Headrick, (R) 23:481

"Topics in the History of Technology [I]," 9:336

Notes on a session, the first of two on work in progress at SHOT's 1967 Toronto meeting, chaired by Lynwood Bryant with papers by Asit Biswas on seventeenth-century hydrology, Stanley Sandler on the modern British capital ship, George Basalla on imperialism, Reynold Wik on the Model T Ford, and Barton Hacker on Project Gemini.

"Topics in the History of Technology [II]," 9:338

Notes on the second Toronto works-in-progress session, chaired by John Burke with papers by J. J. Brown on Canadian technical museums, Bruce Sinclair on technical and classical education in antebellum Philadelphia, and Carroll Pursell on 1930s science and technology.

"Topics in the History of Technology," 10:196

Notes on a works-in-progress session chaired by Robert Multhauf at SHOT's 1968 Dallas meeting with papers by Ladislao Reti on the double-stroke principle, Raymond Merritt on engineers and cities, Robert Selby on World War II earthmoving equipment, John Logsdon on the lunar landing decision, Russell Fries on firearms industries, and Barton Hacker on controversial innovations.

"Topics in the History of Technology," 11:223

Notes on a works-in-progress session chaired by Cyril Smith at SHOT's 1969 Washington meeting with papers by Kenneth Roberts on Connecticut clocks, Eric Robinson on Watt's patents, John Logsdon on lunar orbit rendezvous, and Arline Custer on the *National Union Catalogue of Manuscript Collections*.

"Topics in the History of Technology," J. G. Burke, 12:241

"Topics in the History of Technology," E. T. Layton, Jr., 13:440

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Topping, A. D., "The Inaccurate *Slide Rule*," 7:408

A less sanguine view than Hathway's (7:69) about the historical value of Neville Shute's autobiography.

———, (R) Higham, *The British Rigid Airship*, 6:312; (R) Clarke, *The History of Airships*, 6:315; (R) Smith, *The Airships "Akron" and "Macon,"* 7:554

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Program and business notes on SHOT's tenth annual meeting.

"The Toronto Meeting, October 16–19, 1980," 22:570

Program and business notes on SHOT's twenty-third annual meeting.

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"Toward a Discipline of the History of Technology," E. S. Ferguson, 15:13

"Toward a Philosophy of Technology," 7:209
Notes on a session chaired by Norwood Russell at SHOT's 1965 San Francisco meeting with papers by Joseph Agassi distinguishing between science and technology, Henryk Skolimowski on technological thinking, and comments by J. O. Wisdom and Ian Jarvie.

"Toward a Philosophy of Technology," 7:301
Topical issue on what technology means, especially contrasted with science: preface by Kranzberg (7:301); papers by Mumford (7:303), Feibleman (7:318), Bunge (7:329), Agassi (7:348), and Skolimowski (7:371); comments by Wisdom (7:367) and Jarvie (7:384).

"Toward a Philosophy of Technology: Prefatory Note," M. Kranzberg, 7:301

Toward a Planned Society: From Roosevelt to Nixon, O. L. Graham, Jr., (R) 18:127

Toward a Reasonable Society, C. E. Ayres, (R) 4:118

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"Toward a Standard of Excellence: The Nature and Purpose of Exhibit Reviews," T. W. Leavitt, 9:70

"Toward a Standard of Excellence: The Second Installment," M. R. Smith, 15:76

"Toward Technology Transfer: The Engineering Foundation Research Conference on 'Technology and the Civilian Economy,' " E. Schrier, 5:344

"Toward Technology Transfer: Epilogue," C. Kimball, 5:358

Toward the Endless Frontier: History of the Committee on Science and Technology, 1959–1979, K. Hechler, (R) 22:209

The Tower and the Bridge: The New Art of Structural Engineering, D. P. Billington, (R)25:896

A Tower in Babel, vol. 1 of *A History of Broadcasting in the United States*, E. Barnouw, (R) 8:510

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The 1963 conference addressed generally the role of the humanities in solving problems of rapid technological and social change, specifically such issues as receptivity to change, humanistic imperatives, education and automation, manpower needs versus human needs, and radical versus reformist answers.

———, (R) Smith, *Mark Twain's Fable of Progress*, 6:527; *Brooklyn Bridge*, (R) 7:109

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"A Trade Catalog on the Transmission of Power by Wire Rope," C. W. Pursell, Jr., 16:70

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Tucker, D. Gordon, "François van Ryssel-berghe: Pioneer of Long-Distance Telephony," 19:650
During the 1880s, the first successful long-distance system in Europe used telegraph lines for the sparse traffic.
———, "Diamond Jubilee of the Newcomen Society: The Science Museum, London, November 29, 1980," 23:73
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Tucker's comparative analysis of *T&C* and the *Transactions*, Norman Smith's attempt to define a distinct history of engineering, Rupert Hall's concern to distinguish history of science from history of technology, John Harris's brief for addressing technology's social context, R. A. Buchanan's effort to link industrial archaeology to history, and Ian McNeil's historiography of technology.

———, (R) Hannah, *Electricity before Nationalisation*, 21:254

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Tunnard, Christopher, *A World with a View*, (R) 20:204

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Twelfth-Century Europe: An Interpretive Essay, S. R. Packard, (R) 15:631

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Twenty-five Years of the American Astronautical Society: Historical Reflections and Projections, 1954–1979, E. M. Emme, ed., (R) 22:639

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Two Cheers for the Affluent Society: A Spirited Defense of Economic Growth, W. Beckerman, (R) 17:188

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Tylecote, R. F., *Metallurgy in Archaeology*, (R) 5:254; (R) Rożdzieński, *Officina ferraria*, 18:690; *A History of Metallurgy*, (R) 19:111

Tyler, Ralph W., "Where We Came Out," 3:651

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Tyler, Stephen A.; *see* Siegel, Bernard J.

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Typefounding in America, 1787–1825, R. G. Silver, (R) 8:102

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Understanding Technology, C. Süsskind, (R) 15:80

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———, "The Rate of Bridge Failure," 22:847
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———, (R) Gallagher, *A Thousand Thoughts on Technology and Human Values*, 21:700; (R) Partridge, ed., *Responsibilities to Future Generations*, 23:279
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A significant but highly decentralized industry, tanning clung to traditional methods largely because in the U.S. abundant raw materials made such conservatism economically viable.

———, "The Metallic Woodworking Plane: An American Contribution to Hand-Tool Design," 7:38

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———, (R) Sloane, *A Museum of Early American Tools,* 6:125; *Tanning in the United States to 1850,* (R) 6:462; (R) Jenkins, *Traditional Country Craftsmen,* 8:104; (R) Glassie, *Patterns in the Material Folk Culture of the Eastern United States,* 11:108; (R) Roberts and Roberts, *Planemakers and Other Edge Tool Enterprises in New York in the Nineteenth Century,* 12:648; (R) Kauffman, *American Axes,* 14:83; (R) Quimby, ed., *Winterthur Portfolio 7,* 14:527; (R) Roberts, *Wooden Planes in 19th-Century America,* 18:541

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———, "Human Resources and Manpower Needs," 7:67

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———, "Marshall McLuhan and the Extensions of Man," 7:504

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———, "A New Look at Ancient Technology: The Smithsonian Program," 8:485

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———, "Culture and Continuity: A Commentary on Mazlish and Mumford," 9:203

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———, "Hans Eberhard Wulff (1907–1967)," 9:459

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———, "The Origin of Agriculture and Technology: Aarhus, Denmark, November 21–25, 1978. I. Introductory Note: Whence Early Technology? East, West, or Nowhere?" 22:122

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———, *The Coming of the Age of Steel,* (R) 4:71, 5:87; (R) Flinn, *Men of Iron,* 5:257; (R) Harris, *The Copper King,* 6:278; (R) Gale, *Iron and Steel,* 11:630; (R) Pfeiffer, *The Emergence of Society,* 19:509; (R) Mirsky, *Sir Aurel Stein,* 19:512; (R) Rapp and Aschenbrenner, eds., *Excavations at Nichoria in Southwest Greece,* 20:618; (R) Wächtler and Engewald, eds., *Internationales Symposium zur Geschichte des Berghaus Hüttenwesens,* 23:232; *see also* Franklin, Alan D.

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White, Dana F., "The Apocalyptic Vision of Paolo Soleri," 12:75
Essay review of Solari, *Arcology*, and exhibit review of "The Architectural Vision of Paolo Soleri," Corcoran Gallery of Art and Whitney Museum of American Art, July–September 1970.
———, (R) Speer, *Inside the Third Reich*, 12:529
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White, John H., Jr., "Septimus Norris and the Origin of the Ten-Wheel Locomotive," 9:55
Norris (1818–62) sought via inflated patent claims to capitalize on his early association with the straightforward mechanical development of the ten-wheel from the eight-wheel locomotive.
———, "Baltimore and Ohio Transportation Museum," 11:70

Review of exhibits at the Baltimore museum housing one of the oldest and most comprehensive railroad collections in the world.

———, "Origins of the Steam Fire Engine," 14:166
How Alexander B. Latta of Cincinnati received undeserved credit for inventing the steam fire engine.

———, "The Railway Museum: Past, Present, and Future," 14:599
On the history and shortcomings of railway museums.

———, "The Railroad Velocipede," 17:515
George S. Sheffield devised the lightweight railroad utility vehicle.

———, "'A Perfect Light Is a Luxury': Pintsch Gas Car Lighting," 18:64
The Berlin lampmaker and tinsmith, Julius Pintsch, devised a successful coal-gas lighting system for railroad passenger cars not supplanted by electricity until 1910.

———, "More Light," 19:604
Communication responding to van Oss, 19:602.

———, "Industrial Locomotives: The Forgotten Servant," 21:209
The decisive role of tank engines in industrial railroads from 1870 to 1950 remains a largely untold story.

———, "Safety with a Bang: The Railway Torpedo," 23:195
Edward A. Cowper's nineteenth-century invention remains in use for signaling danger on the railway ahead.

———, "The California State Railroad Museum: A Louvre for Locomotives," 24:644
The newly opened museum in Sacramento may serve as a model of what a railroad museum should be, notably in its unmatched meticulousness of restoration.

———, *Cincinnati Locomotive Builders,* (R) 7:428; (R) Plowden, *Farewell to Steam,* 8:406; (R) Knapke, *The Railroad Caboose,* 9:614; (R) *The Narrow-Gauge Locomotive,* 9:614; (R) Pinkepank, *Diesel Spotter's Guide,* 9:616; (R) Carstens, ed., *Loco 1,* 9:616; *American Locomotives,* (R) 10:316; (R) Wiener, *Articulated Locomotives,* 12:656; (R) de Pater, *The Locomotives Built by Machinefabriek "Breda,"* 13:315; (R) Koch, *The Shay Locomotive,* 13:316; (R) Forney and Hitt, *The Car Builder's Dictionary,* 13:636; (R) Fowler, *Locomotive Dictionary,* 14:304; (R) Hitt, *Electric Railway Dictionary,* 14:306; (R) Daly and Rohrecht, *An Illustrated Handbook of Fire Apparatus,* 14:630; (R) Peckham, *Fighting Fire with Fire,* 14:630; (R) *Railroad Gazette* Editors, *Recent Locomotives,* 14:635; *American Single Locomotives and the "Pioneer,"* (R) 15:337; *Horsecars, Cable Cars and Omnibuses,* (R) 17:765; *The Pioneer,* (R) 18:102; (R) Buckley, *A History of Tramways from Horse to Rapid Transit,* 18:102; *The American Railroad Passenger Car,* (R) 20:370; *The John Bull,* (R) 23:639; (R) Schivelbusch, *The Railway Journey,* 24:515; *A Short History of American Locomotive Builders in the Steam Era,* (R) 24:694

———, ed., *Development of the Locomotive Engine,* A. Sinclair, (R) 12:653

White, K. D., *Agricultural Implements of the Roman World,* (R) 9:612; *A Bibliography of Roman Agriculture,* (R) 13:113; (R) L. White, ed., *The Transformation of the Roman World,* 16:481; *Farm Equipment of the Roman World,* (R) 17:541

White, Lawrence J., *The Automobile Industry since 1945,* (R) 13:510; (R) Flink, *The Car Culture,* 17:400

White, Lynn, jr., "Technology in the Middle Ages," 1:339
Review of the second volume of Singer's *History of Technology.*

———, "Eilmer of Malmesbury, an Eleventh Century Aviator: A Case Study of Technological Innovation," 2:97
Anglo-Saxon England provided an atmosphere congenial to technological originality, and Eilmer's flight, probably with rigid wings, began the development of kites and gliders that culminated in 1903 at Kitty Hawk.

———, "The Act of Invention: Causes, Contexts, Continuities, and Consequences," 3:486
Examining eleven technological "acts" suggests that technological innovation is not a single process; cf. Kranzberg, 3:519.

———, "Theophilus Redivivus," 5:224
Essay review of two recent editions of a twelfth-century work: *De diuersis artibus,* translated by C. R. Dodwell; and *On Divers Arts,* translated by John G. Hawthorne and Cyril Stanley Smith.

———, "The Invention of the Parachute," 9:462
The anonymous author of British Museum Additional Manuscript 34,113, assigned to Italy in the 1470s, seems to have invented the parachute.

———, "Kyeser's *Bellifortis*: The First Technological Treatise of the Fifteenth Century," 10:436
Essay review of Conrad Kyeser aus Eichstätt, *Bellifortis*, translated by Götz Quarg.
———, "Robert James Forbes (1900–1973)," 15:438
Memorial to the noted historian of ancient technology and first recipient of SHOT's Leonardo da Vinci medal.
———, "The Study of Medieval Technology, 1924–1974: Personal Reflections," 16:519
Historiographical and autobiographical remarks.
———, (R) Centre de documentation d'histoire des techniques, *Documents pour l'histoire des techniques*, 4:51; *Medieval Technology and Social Change*, (R) 4:62; (R) Treue et al., eds., *Das Hausbuch der Mendelschen Zwölfbrüderstiftung zu Nürnberg*, 9:480; *Machina ex Deo*, (R) 11:96; *Medieval Religion and Technology*, (R) 21:82; (R) Unger, *The Ship in the Medieval Economy*, 23:223
———, ed., *The Transformation of the Roman World*, (R) 16:481
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White, Roger B., "Whither the Urban History Exhibit? The Peale Museum's 'Rowhouse,' " 24:76
"Rowhouse," reflects a new trend in museology away from nostalgia toward urban and social history; though well-done and successful, it suffers somewhat from aesthetic and materialist overemphases.
———, (R) Gilbert and Samuels, *The Taxicab*, 25:165; (R) Sloniger, *The VW Story*, 25:365; (R) Fry, *The VW Beetle*, 25:365
White, Ruth, *Yankee from Sweden*, (R) 2:65
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"White Oil: Petrochemical Development in Russia and the West," H. Schindler, 25:577
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Whitnah, Donald R., *A History of the United States Weather Bureau*, (R) 3:332; *Safer Skyways*, (R) 9:506
Whitrow, Magda, ed., *ISIS Cumulative Bibliography*, vols. 1 and 2, (R) 14:354; vol. 3, (R) 19:266
Whittick, Arnold, ed., *Encyclopaedia of Urban Planning*, (R) 16:315
Whitworth, Joseph; *see* Wallis, George
Who Needs People? Automation and Your Future, R. E. Cubbedge, (R) 5:104
Who Pays for Clean Air: The Cost and Benefit Distribution of Federal Automobile Emission Controls, D. Harrison, Jr., (R) 18:135
Why Buildings Stand Up: The Strength of Architecture, M. Salvadori, (R) 22:790
Wiebe, Robert, (R) Bates, *The Origins of Teapot Dome*, 5:614
Wiebenson, Dora, *Tony Garnier*, (R) 11:428
Wiener, Lionel, *Articulated Locomotives*, (R) 12:656
Wiener, Martin J., *English Culture and the Decline of Industrial Spirit*, (R) 24:130
Wiener, Norbert, *God & Golem, Inc.*, (R) 6:531
Wiezenbaum, Joseph, *Computer Power and Human Reason*, (R) 17:813
Wik, Reynold Millard, "Agricultural Machinery," 1:381
Review of this subject's treatment in Singer's five-volume *History of Technology*.
———, "Henry Ford's Science and Technology for Rural America," 3:247
Between the wars, Ford sponsored or promoted a host of projects to mechanize farming, create industrial uses for farm products, and rationalize agriculture.
———, "Women, Technology and Social Change," 15:463
Summary of a session at SHOT's 1973 San Francisco meeting with papers by Carroll Pursell on gender and technology between the wars, Ruth Cowan on household technology, and comments by Gaye Tuchman.
———, "Benjamin Holt and the Invention of the Track-Type Tractor," 20:90
Although not the first to conceive the idea or sell a machine based on it, Holt transformed the crawler tractor into a widely marketed general-purpose machine.
———, (R) Spence, *God Speed the Plow*, 1:187; (R) Hill and Nevins, *Ford*, 5:616;

(R) Rae, ed., *Henry Ford*, 11:311; (R) Hayter, *The Troubled Farmer*, 13:93; (R) Rae, *The Road and the Car in American Life*, 14:308; *Henry Ford and Grass-Roots America*, (R) 14:645; (R) Culbert, *News for Everyman*, 18:713; (R) Nye, *Henry Ford*, 21:686; (R) Berger, *The Devil's Wagon in God's Country*, 22:177; (R) Rosen, *The Modern Stentors*, 23:126

Wilburn, Jean Alexander; *see* Fuchs, Victor R.

Wilcox, Frank N., *The Ohio Canals*, W. A. McGill, ed., (R) 12:107

Wilcox, Lyle; *see* McMains, Harvey

Wild, J. P., *Textile Manufacture in the Northern Roman Provinces*, (R) 12:334

Wiles, Peter, (R) Granick, *Soviet Metal-fabricating and Economic Development*, 10:117

Wilhelmsen, Frederick D., "Through a Rearview Mirror—Darkly," 14:22

Response to argument by McLuhan and Nevitt (14:1) asking what is cause, what effect.

Wilkes, Lyall, and Gordon Dodds, *Tyneside Classical*, (R) 7:242

Wilkins, Mira, (R) Wells, *Third World Multinationals*, 25:869

Wilkinson, Kenneth P., (R) Beal et al., eds., *Sociological Perspectives of Domestic Development*, 13:644; *Papermaking in America*, (R) 18:540

Wilkinson, Norman B., "Brandywine Borrowings from European Technology," 4:1

Several industries in the lower Brandywine Valley upstream from Wilmington, Delaware, 1791–1816, show methods, machinery, and know-how freely borrowed from Europe; awarded 1963 Abbott Payson Usher Prize.

———, "In Anticipation of Frederick W. Taylor: A Study of Work by Lammot du Pont, 1872," 6:208

Du Pont's tabulation of distances workers moved and lifted ingredients in manufacturing powder raises intriguing questions about the origins of efficiency studies.

———, "Making Powder, by Jean Appier Hanzelet," 6:663

An illustration from *La Pyrotechnie* (1630) depicts techniques as much as a century outdated.

———, (R) Hindle, *David Rittenhouse*, 6:465

William Avery Baker: A Tribute from His Friends, E. A. R. Ronnberg, Jr., (R) 25:878

William Caslon: Master of Letters, J. Ball, (R) 15:329

William David Coolidge: A Centenarian and His Work, H. A. Liebhafsky, (R) 17:153

William Jessop, Engineer, C. Hadfield, and A. W. Skempton, (R) 21:246

William Shipley: Founder of the Royal Society of Arts, D. G. C. Allan, (R) 10:309

William Tatham and the Culture of Tobacco: Including a Facsimile Reprint of an "Historical and Practical Essay on the Culture and Commerce of Tobacco," G. Melvin Herndon, (R) 12:104

Williams, Hector, (R) Rougé, *Ships and Fleets of the Ancient Mediterranean*, 25:323

Williams, Hermann Warner, Jr., (R) Blair, *European Armour*, 1:262

Williams, James C., "Women and Technology Studies," 25:628

Summary of a session at SHOT's 1983 Washington meeting with papers by Joan Rothschild on historiography, Alexandra Aldridge on women in high-tech, Sally Hacker on math in engineering education, Svante Lindquist on technological stagnation, and comments by George Maughan.

Williams, L. Pearce, (R) Holton and Elkana, eds., *Albert Einstein*, 25:699

Williams, Michael, *The Draining of the Somerset Levels*, (R) 12:345; *The Making of the South Australian Landscape*, (R) 17:408

Williams, Raymond, *Television*, (R) 19:259

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Williams, Rosalind H., *Dream Worlds*, (R) 24:500; (R) McKendrick et al., *The Birth of a Consumer Society*, 25:337

Williams, Trevor I., "Williams Reviews the Review Issue," 2:254

Comments on the special issue of *T&C* (vol. 1, no. 4) devoted to Singer's five-volume *History of Technology*, which Williams co-edited.

———, (R) Mathias, *The Brewing Industry in England*, 1:188; (R) Lynch and Vaizey, *Guiness's Brewery in the Irish Economy*, 2:273; (R) Janes, *The Red Barrel*, 5:452; (R) Jones, *The State and the Emergence of the British Oil Industry*, 24:132; *A History of the British Gas Industry*, (R) 24:134; *see also* Derry, T. K.

———, ed., *A History of Technology*, (R) 23:631; *see also* Singer, Charles

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"Williams Reviews the Review Issue," T. I. Williams, 2:254

Williamson, Harold F., (R) Hilton and Due, *The Electric Interurban Railways in America*, 2:284; (R) Chandler, *Strategy and Structure*, 5:107; (R) McCallum and McCallum, *The Wire That Fenced the West*, 8:107; (R) Rosenberg, *Technology and American Economic Growth*, 14:83; (R) Solberg, *Oil Power*, 18:113

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Wilson, Eugene E., *Slipstream*, (R) 7:441; (R) Clark, *Carrier Admiral*, 9:505; (R) Dickey, *The Liberty Engine*, 10:464

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Wilson, Richard, (R) Lovins and Price, *Non-nuclear Futures*, 17:811

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Wiltshire and Somerset Woollen Mills, K. Rogers, (R) 19:226

The Wind and Beyond: Theodore von Kármán, Pioneer in Aviation and Pathfinder in Space, T. von Kármán, (R) 9:507

Wind-Catchers: American Windmills of Yesterday and Tomorrow, V. Torrey, (R) 18:548

Windmills, S. Beedell, (R) 18:92

"Windmills in Southern Europe," R. Wailes, 9:456

Windmühlen: Der Stand der Forschung über das Vorkommen und den Ursprung, J. C. Notebaart, (R) 15:630

Wingo, Lowden, Jr., ed., *Cities and Space*, (R) 5:628

Wings of Gold: How the Aeroplane Developed New Guinea, J. Sinclair, (R) 22:641

Winkelmann, Rainer, ed., *Karl Marx*, (R) 25:648

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The Winning Weapon: The Atomic Bomb in the Cold War, 1945-1950, G. Herken, (R) 25:666

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Winterthur Portfolio One, M. M. Naeve, ed., (R) 6:322; *Two*, (R) 8:406; *Three*, (R) 10:448; *Six*, R. K. Doud and I. M. G. Quimby, eds., (R) 13:85; *Seven*, I. M. G. Quimby, ed., (R) 14:527; *Ten*, (R) 17:606; *Twelve*, (R) 22:169; *Thirteen: American Furniture and Its Makers*, (R) 21:669

The Wire That Fenced the West, H. D. McCallum and F. T. McCallum, (R) 8:107

Wireless Telegraphy: The Royal Institution Library of Science (Being the Friday Evening Discourses in Physical Sciences Held at the Royal Institution, 1851–1939), E. Eastwood, ed., (R) 17:145

Wisdom, J. O., "The Need for Corroboration: Comments on Agassi's Paper," 7:367

Wisdom endorses Agassi's thesis (7:348) that science and technology are distinct, but differs on other points; cf. Agassi, 8:78.

———, "Rules for Making Discoveries: Reply to Dr. Agassi," 8:210

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Wise, George, "A New Role for Professional Scientists in Industry: Industrial Research at General Electric, 1900–1916," 21:408

How and why General Electric created a nonacademic research setting attractive to scientists; awarded 1983 Abbott Payson Usher Prize.

———, "The Context of Innovation," 25:633

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———, (R) Süsskind, *Twenty-five Engineers and Inventors*, 20:230; (R) Marton and Marton, eds., *Advances in Electronics and*

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"Women and Technology Studies," J. C. Williams, 25:628

Women and the Scientific Professions, J. A. Mattfeld and C. G. Van Aken, eds., (R) 7:571

Women and the Social Costs of Economic Development, E. Moen et al., (R) 23:501

Women at Work, W. L. O'Neill, ed., (R) 14:326

Women at Work: The Transformation of Work and Community in Lowell, Massachusetts, 1826–1860, T. Dublin, (R) 21:677

Women in Science and Technology: A Report on an MIT Workshop, E. Ruina, ed., (R) 16:324

"Women in Technological History," E. Hitz, 23:449

Women in the Soviet Economy: Their Role in Economic, Scientific, and Technological Developments, N. T. Dodge, (R) 8:242

"Women Inventors in America," C. W. Pursell, Jr., 22:545

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"Wood Pulp, Water Pollution, and Advertising," J. G. Burke, 20:175

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Woodbury, Robert S., "The Legend of Eli Whitney and Interchangeable Parts," 1:235
Whitney's role in the development of manufacturing by the uniformity principle seems to have been much exaggerated; awarded the first Abbott Payson Usher Prize in 1961.

———, "The Scholarly Future of the History of Technology," 1:345
Critical review of Singer's five-volume *History of Technology*.

———, *History of the Gear-cutting Machine*, (R) 1:186; (R) *Contributions from the Museum of History and Technology*, papers 1–11, (R) 1:269; *History of the Milling Machine*, (R) 2:43; (R) Wittmann, *Die*

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Woodcock, John, (R) Kahn et al., *The Next 200 Years*, 18:585

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Woodruff, William, and Helga Woodruff, "Economic Growth: Myth or Reality? The Interrelatedness of Continents and the Diffusion of Technology, 1860–1960," 7:453

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Woods, David L., "A Fascinating Mishmash," 18:391

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———, *A History of Tactical Communication Techniques*, (R) 17:151; (R) Roland, *Underwater Warfare in the Age of Sail*, 20:199; (R) Robinson, *American Forts*, 20:644; (R) Brooke, *John M. Brooke*, 23:673

Woodson, Wesley E., and Donald W. Conover, *Human Engineering Guide for Equipment Designers*, (R) 7:124

Woodward, David, ed., *Five Centuries of Map Printing*, (R) 18:91

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Woodward, H. W., *Art, Feat and Mystery*, (R) 21:253

Woodward, Kathleen, ed., *The Myths of Information*, (R) 23:93; *see also* de Lauretis, Teresa

Woolf, Harry, ed., *Science as a Cultural Force*, (R) 6:683

Woolley, Leonard; *see* Hawkes, Jacquetta

Woolrich, W. R., *Men of Ingenuity from beneath the Orange Tower*, (R) 7:111; *The Men Who Created Cold*, (R) 9:140

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Work and Family in the United States: A Critical Review and Agenda for Research and Policy, R. M. Kanter, (R) 19:129

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Work and Revolution in France: The Language of Labor from the Old Regime to 1848, W. H. Sewell, Jr., (R) 24:675

Work and Technology, M. R. Haug and J. Dofny, eds., (R) 19:585

"Work and Tools," P. F. Drucker, 1:28

"Work, Culture, and Technology," P. Scranton, 24:485

The Work Ethic in Industrial America, 1850–1920, D. T. Rodgers, (R) 19:756

Work, Society, and Culture, Y. Simon, (R) 13:98

Work without Salvation: America's Intellectuals and Industrial Alienation, 1880–1910, J. B. Gilbert, (R) 19:753

Workers' Attitudes and Technology, D. Wedderburn and R. Crompton, (R) 14:515

Workers in the Industrial Revolution, P. N. Stearns and D. I. Walkowitz, (R) 16:630

Workers' Participation in Industry, M. Poole, (R) 17:172

Working-Class Images of Society, M. Bulmer, ed., (R) 17:585

Working for the Railroad: The Organization of Work in the Nineteenth Century, W. Licht, (R) 25:865

"Work-in-Progress in the History of Technology," 8:320

Notes on a session chaired by Elmer Belt at SHOT's 1966 Washington meeting with papers by Lynwood Bryant on the diesel engine, David Lewis on nineteenth-century U.S. industrial discipline, Mel Gorman on an early electric motor in India, Barton Hacker on military mechanization, and Reynold Wik on the invention of the farm tractor.

"Work-in-Progress Session," 4:267

Notes on a session at SHOT's 1962 Philadelphia meeting with papers by Carl Condit on the Garrick Theater Building, Peter Drucker on resistance to change, Eugene Ferguson

early nineteenth-century U.S. technology, David Lewis on U.S. industrial research, Frank Prager on Galileo's technical interests, Robert Vogel on underwater bridge foundations, and Lynn White on Renaissance fortifications.

"Works in Progress: American Technology," W. D. Lewis, 24:471

"Works in Progress: European Technology," D. A. Hounshell, 24:478

The Works of Isambard Kingdom Brunel, A. Pugsley, ed., (R) 18:529

Workshop of the British Empire: Engineering and Shipbuilding in the West of Scotland, M. S. Moss and J. R. Hume, (R) 20:363

"Workshop on the History of Science and Technology: University of British Columbia, October 1971," R. W. Unger, 13:622

"Workshop on the Interrelations between Science and Technology, and Ethics and Values: Reston, Virginia, April 10–12, 1975," R. E. McGinn, 17:249

Workshops in the Wilderness: The European Response to American Industrialization, 1830–1860, M. Fisher, (R) 9:125

[Works-in-progress,] 5:288
Listing of papers in a session chaired by John Brainerd at SHOT's 1963 Philadelphia meeting.

[Works-in-progress I,] 6:334
Notes on the first of two work-in-progress sessions at SHOT's 1964 Montreal meeting, chaired by J. J. Brown with papers by Robert MacMurray on production technology, Robin Higham on British resistance to the jet age, Edward Ezell on government arsenals, Anthony Garvan on the transfer of wool-textile technology, and Edwin Battison on translating Besson's *Theatrum instrumentorum et machinorum*.

[Works-in-progress II,] 6:335
Notes on the second Montreal work-in-progress session, chaired by Bern Dibner with papers by Robert Jewett on structural I-beams, Neville Kirk on the sea-keeping warship, Harry Eisenman on Charles Brush, and Gene Cesari on perception in the history of technology.

[Works-in-progress,] 7:214
Notes on a session chaired by Mel Gorman at SHOT's 1965 San Francisco meeting with papers by Loyd Swenson on Charles Lindbergh and Alan Shepard, Barton Hacker on the psychology of military mechanization, Bernard Finn on Bell's 1876 experiments, and Robert Jewett on structural rail-beams.

[Works-in-progress,] T. P. Hughes, 16:437

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[Works-in-progress I,] M. H. Rose, 22:594

[Works-in-progress II,] P. T. Carroll, 22:595

World Archaeology, vol. 1, C. Platt, ed., (R) 12:159

The World Automotive Industry, G. Bloomfield, (R) 20:376

World Design Science Decade, 1965–1975: Phase I (1965), R. B. Fuller and J. McHale, document 1, *Inventory of World Resources, Human Trends, and Needs*, (R) 4:354; document 2, *The Design Initiative*, (R) 6:504; document 3, *Comprehensive Thinking*, (R) 7:262; document 4, *The Ten Year Program*, (R) 7:262

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The World of Leonardo da Vinci: Man of Science, Engineer and Dreamer of Flight, I. B. Hart, (R) 4:84

The World of the First Australians, R. M. Berndt and C. H. Berndt, (R) 7:576

The World of the Javanese Keris, G. Solyom and B. Solyom, (R) 21:233

The World of Walther Nernst: The Rise and Fall of German Science, 1864–1941, K. Mendelssohn, (R) 17:151

The World Role of Universities, E. W. Weidner, (R) 4:239

World Technology and Human Destiny, R. Aron, ed., (R) 6:144

The World That Could Be, R. C. North, (R) 20:822

A World with a View: An Inquiry into the Nature of Scenic Values, C. Tunnard, (R) 20:204

Worlds of Pain: Life in the Working-Class Family, L. B. Rubin, (R) 19:234

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The Worshipful Company of Wheelwrights of the City of London, 1670–1970, E. Bennett, (R) 16:94

Worthington, Rick, (R) McMains and Wilcox, eds., *Alternatives for Growth*, 22:677

Wosk, Julie Helen, "Humanities and the Machine: Responses to Technology (State University of New York, Maritime College, Fort Schuyler, Bronx, April, 1981)," 23:435
Among the major topics discussed at the interdisciplinary conference were medical and engineering ethics, art and technology, and artificial intelligence.

———, "A Unique Exhibition Space: The Brooklyn Bridge Anchorage," 25:292
The stone anchorage at the Brooklyn end of the bridge was renovated as an exhibition hall.

Wrenn, Tony P., and Elizabeth D. Mulloy, *America's Forgotten Architecture*, (R) 19:733

Wright, A. E. G.; *see* Carr, J. C.

Wright, Gwendolyn, *Building the Dream*, (R) 24:283

Wright, Helena, "Engineering the American Home," 24:481
Summary of a session at SHOT's 1982 Philadelphia meeting with papers by Lynn Nyhart on the home economics movement, Brian Horrigan on ideas about the home of tomorrow, Edward Pershey on industrial design, and comments by Ruth Cowan.

———; *see also* Leavitt, Thomas W.

Wright, J. E., "The Library of the Institution of Electrical Engineers in London," 9:191
Founded in 1872, the library has acquired 13,000 books, 600 sets of periodicals, and several important special collections: early works on electricity and magnetism, Faraday materials, and Oliver Heaviside materials.

Wright, Lawrence, *Clockwork Man*, (R) 12:490

Wright, Monte Duane, *Most Probable Position*, (R) 15:116; (R) Jacobs, *The UFO Controversy in America*, 17:596; (R) Bright, *The Jet Makers*, 21:135

Wright, Quincy, "The Impact of Technology upon Cultural Change," 5:49
Modern communications may foster long-run cultural convergence; abstract of a paper from the conference, "Technology and the Idea of Mankind," with a summary of the discussion that followed.

Wright, Thomas, (R) MacGregor, *Merchant Sailing Ships*, 24:265

The Wright Brothers: Heirs of Prometheus, R. P. Hallion, ed., (R) 21:130

"Wu Ch'i-chün: Profile of a Chinese Scholar-Technologist," E. T. Z. Sun, 6:394

Wulff, Hans E., "Notes on Damascene Steel and Pamor," 6:627
The technique of pamor may have been transmitted from Persia via Moslem intermediaries to Indonesia.

———, "A Postscript to Reti's Notes on Juanelo Turriano's Water Mills," 7:398
Reti's estimate (6:428) of the power output from the sixteenth-century Spanish mills described by Juanelo is challenged by data from modern Persian mills very much like them.

———, "Door Locks in Persia," 7:497
Classification and description of seven major types of traditional door locks still in use, though disappearing.

———, *The Traditional Crafts of Persia*, (R) 9:476

Wulff, Keith M., ed., *Regulation of Scientific Inquiry*, (R) 21:697

Wyckoff, Dorothy, trans., *Book of Minerals*, Albertus Magnus, (R) 9:219

Wyke, John, *A Catalogue of Tools for Watch and Clock Makers*, (R) 21:495

Wykres żelazo-węgiel wrozwoju historycznym [History of the iron-carbon diagram], E. Tyrkiel, (R) 12:652

Wyld, Lionel D., *Low Bridge!* (R) 5:612

Wyman, Mark, *The Hard Rock Epic*, (R) 21:681

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Yakovlev, A. S., *Fifty Years of Soviet Aircraft Construction*, (R) 13:111

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Yankee Dreamers and Doers, E. S. Grant, (R) 18:253

Yankee Enterprise: The Rise of the American System of Manufactures, O. Mayr and R. C. Post, eds., (R) 25:150

Yankee from Sweden: The Dream and the Reality in the Days of John Ericsson, R. White, (R) 2:65

"Yankee Practice and Engineering Theory: Charles T. Porter and the Dynamics of the High-Speed Steam Engine," O. Mayr, 16:570

Yates, Brock, *The Decline and Fall of the American Automobile Industry,* (R) 25:363

Yates, W. Ross, (R) McHugh, *Alexander Holley and the Makers of Steel,* 22:798; (R) Mulholland, *A History of Metals in Colonial America,* 23:495

Yeager, Mary, *Competition and Regulation,* (R) 24:274

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Yoder, C. P. "Bill," *Delaware Canal Journal,* (R) 15:106

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Young, Jimmy, *A Short History of Ale,* (R) 22:193

Young, Louise B., *Power over People,* (R) 15:127

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Zapffe, Carl A., (R) American Institute of Mining Engineers, *A History of Iron and Steelmaking in the United States,* 3:320

Zauberman, Alfred, *Industrial Progress in Poland, Czechoslovakia, and East Germany,* (R) 6:675

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Zimmerman, Joseph F., (R) Swain, *Federal Conservation Policy,* 5:465; (R) Ottoson, ed., *Land Use Policy and Problems in the United States,* 6:140

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